



**Groundwater Sample Results,  
Level 2 Laboratory Report, Level 4 Laboratory Report,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Report, SDG J26324-1**

*Naval Air Station Meridian  
Meridian, Mississippi*

July 2019

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Sacramento

880 Riverside Parkway

West Sacramento, CA 95605

Tel: (916)373-5600

TestAmerica Job ID: 320-26324-1

Client Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

Revision: 1

For:

CH2M Hill, Inc.

2411 Dulles Corner Park

Suite 500

Herndon, Virginia 20171

Attn: Mr. Michael Zamboni



Authorized for release by:

3/29/2017 5:34:03 PM

Jill Kellmann, Manager of Project Management

(916)374-4402

[jill.kellmann@testamericainc.com](mailto:jill.kellmann@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16

# Table of Contents

|                                    |    |
|------------------------------------|----|
| Cover Page . . . . .               | 1  |
| Table of Contents . . . . .        | 2  |
| Definitions/Glossary . . . . .     | 3  |
| Case Narrative . . . . .           | 4  |
| Detection Summary . . . . .        | 6  |
| Client Sample Results . . . . .    | 7  |
| Surrogate Summary . . . . .        | 10 |
| Isotope Dilution Summary . . . . . | 11 |
| QC Sample Results . . . . .        | 12 |
| QC Association Summary . . . . .   | 14 |
| Lab Chronicle . . . . .            | 15 |
| Certification Summary . . . . .    | 17 |
| Method Summary . . . . .           | 18 |
| Sample Summary . . . . .           | 19 |
| Chain of Custody . . . . .         | 20 |
| Receipt Checklists . . . . .       | 21 |



## Definitions/Glossary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

### Qualifiers

#### GC/MS Semi VOA

| Qualifier | Qualifier Description                 |
|-----------|---------------------------------------|
| U         | Undetected at the Limit of Detection. |
| M         | Manual integrated compound.           |

#### LCMS

| Qualifier | Qualifier Description                                                               |
|-----------|-------------------------------------------------------------------------------------|
| M         | Manual integrated compound.                                                         |
| E         | Result exceeded calibration range.                                                  |
| D         | The reported value is from a dilution.                                              |
| J         | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U         | Undetected at the Limit of Detection.                                               |

### 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, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC            | Decision level concentration                                                                                |
| MDA            | Minimum detectable activity                                                                                 |
| EDL            | Estimated Detection Limit                                                                                   |
| MDC            | Minimum detectable concentration                                                                            |
| 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                                                                                        |
| 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)                                                                       |



# Case Narrative

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Job ID: 320-26324-1**

**Laboratory: TestAmerica Sacramento**

## Narrative

### CASE NARRATIVE

**Client: CH2M Hill, Inc.**

**Project: Meridian 10006-7-105420 JM01 Navy Clean**

**Report Number: 320-26324-1**

#### Revision - March 27, 2017

Revision created to include PFBS in the method 537 Mod analyte list.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

#### RECEIPT

The samples were received on 03/04/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.1 C.

#### **Receipt Exceptions**

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): MEAFF-EB04-GW-0317 (320-26324-6). The container time lists 15:45, while the COC lists 15:35.

No sample time noted (however sample is an MS/MSD thus time is entered via parent sample). MEAFF-4BMW02-0317-MS (320-26324-3[MS]) and MEAFF-4BMW02-0317-SD (320-26324-3[MSD])

## Case Narrative

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

---

### Job ID: 320-26324-1 (Continued)

---

#### Laboratory: TestAmerica Sacramento (Continued)

##### 1,4-DIOXANE

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

##### PFAS

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.

The following sample was diluted to bring the concentration of target analytes within the calibration range: MEAFF-4DMW03-0317 (320-26324-2). Elevated reporting limits (RLs) are provided.

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

## Detection Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

### Client Sample ID: MEAFF-4DMW01-0317

### Lab Sample ID: 320-26324-1

| Analyte                             | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|-------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorooctanoic acid (PFOA)       | 220    | M         | 2.5 | 0.73 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS) | 210    | M         | 3.9 | 1.3  | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) | 11     |           | 2.5 | 0.90 | ng/L | 1       |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-4DMW03-0317

### Lab Sample ID: 320-26324-2

| Analyte                                  | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|------------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorooctanoic acid (PFOA)            | 360    | M         | 2.4 | 0.72 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)      | 1100   | M E       | 3.8 | 1.2  | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS)      | 15     | M         | 2.4 | 0.88 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanoic acid (PFOA) - DL       | 390    | D M       | 24  | 7.2  | ng/L | 10      |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS) - DL | 1100   | D         | 38  | 12   | ng/L | 10      |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) - DL | 16     | J D M     | 24  | 8.8  | ng/L | 10      |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-4BMW02-0317

### Lab Sample ID: 320-26324-3

No Detections.

### Client Sample ID: MEAFF-4BMW03-0317

### Lab Sample ID: 320-26324-4

| Analyte                             | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|-------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorobutanesulfonic acid (PFBS) | 4.3    |           | 2.3 | 0.86 | ng/L | 1       |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-EB03-GW-0317

### Lab Sample ID: 320-26324-5

No Detections.

### Client Sample ID: MEAFF-EB04-GW-0317

### Lab Sample ID: 320-26324-6

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-4DMW01-0317**

**Date Collected: 03/03/17 10:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-1**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 220       | M         | 2.5      | 0.73 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 210       | M         | 3.9      | 1.3  | ng/L |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 11        |           | 2.5      | 0.90 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 67        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| 18O2 PFHxS                          | 91        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |

**Client Sample ID: MEAFF-4DMW03-0317**

**Date Collected: 03/03/17 10:50**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-2**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 360       | M         | 2.4      | 0.72 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 1100      | M E       | 3.8      | 1.2  | ng/L |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 15        | M         | 2.4      | 0.88 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 69        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| 13C4 PFOS                           | 76        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| 18O2 PFHxS                          | 83        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |

## Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

| Analyte                             | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 390       | D M       | 24       | 7.2 | ng/L |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Perfluorooctanesulfonic acid (PFOS) | 1100      | D         | 38       | 12  | ng/L |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Perfluorobutanesulfonic acid (PFBS) | 16        | J D M     | 24       | 8.8 | ng/L |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 93        |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| 13C4 PFOS                           | 100       |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| 18O2 PFHxS                          | 113       |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |

**Client Sample ID: MEAFF-4BMW02-0317**

**Date Collected: 03/03/17 13:05**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-3**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U M       | 2.4      | 0.70 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U M       | 3.8      | 1.2  | ng/L |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.86 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 38        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| 13C4 PFOS                           | 93        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-4BMW02-0317**

**Date Collected: 03/03/17 13:05**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-3**

**Matrix: Water**

**Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)**

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 18O2 PFHxS       | 102       |           | 25 - 150 | 03/09/17 10:15 | 03/12/17 03:58 | 1       |

**Client Sample ID: MEAFF-4BMW03-0317**

**Date Collected: 03/03/17 15:15**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-4**

**Matrix: Water**

**Method: 537 (Modified) - Perfluorinated Hydrocarbons**

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.3      | 0.70 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U         | 3.7      | 1.2  | ng/L | - | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 4.3       |           | 2.3      | 0.86 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 37        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| 13C4 PFOS                           | 89        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| 18O2 PFHxS                          | 97        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |

**Client Sample ID: MEAFF-EB03-GW-0317**

**Date Collected: 03/03/17 14:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-5**

**Matrix: Water**

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

| Analyte         | Result    | Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|-----------|-----------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.57      | U         | 1.1     | 0.23 | ug/L | - | 03/08/17 08:41 | 03/15/17 00:04 | 1       |
| Surrogate       | %Recovery | Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 76        |           | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/15/17 00:04 | 1       |

**Method: 537 (Modified) - Perfluorinated Hydrocarbons**

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.4      | 0.71 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U         | 3.8      | 1.2  | ng/L | - | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.87 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 106       |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| 18O2 PFHxS                          | 99        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |

**Client Sample ID: MEAFF-EB04-GW-0317**

**Date Collected: 03/03/17 15:35**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-6**

**Matrix: Water**

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

| Analyte         | Result    | Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|-----------|-----------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.54      | U         | 1.1     | 0.21 | ug/L | - | 03/08/17 08:41 | 03/15/17 00:27 | 1       |
| Surrogate       | %Recovery | Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 74        |           | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/15/17 00:27 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-EB04-GW-0317**

**Lab Sample ID: 320-26324-6**

**Date Collected: 03/03/17 15:35**

**Matrix: Water**

**Date Received: 03/04/17 09:15**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.4      | 0.72 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.9       | U         | 3.8      | 1.2  | ng/L | - | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.88 | ng/L | - | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 101       |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| 18O2 PFHxS                          | 95        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |

TestAmerica Sacramento

# Surrogate Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

**Matrix: Water**

**Prep Type: Total/NA**

## Percent Surrogate Recovery (Acceptance Limits)

| Lab Sample ID       | Client Sample ID       | NBZ<br>(42-91) |
|---------------------|------------------------|----------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | 76             |
| 320-26324-6         | MEAFF-EB04-GW-0317     | 74             |
| LCS 320-153806/2-A  | Lab Control Sample     | 75             |
| LCSD 320-153806/3-A | Lab Control Sample Dup | 71             |
| MB 320-153806/1-A   | Method Blank           | 69             |

### Surrogate Legend

NBZ = Nitrobenzene-d5

# Isotope Dilution Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID      | Client Sample ID     | Percent Isotope Dilution Recovery (Acceptance Limits) |                               |                                |
|--------------------|----------------------|-------------------------------------------------------|-------------------------------|--------------------------------|
|                    |                      | <sup>3</sup> C4 PFO/ (25-150)                         | <sup>3</sup> C4 PFO/ (25-150) | <sup>18</sup> O2 PFHx (25-150) |
| 320-26324-1        | MEAFF-4DMW01-0317    | 67                                                    | 90                            | 91                             |
| 320-26324-2        | MEAFF-4DMW03-0317    | 69                                                    | 76                            | 83                             |
| 320-26324-2 - DL   | MEAFF-4DMW03-0317    | 93                                                    | 100                           | 113                            |
| 320-26324-3        | MEAFF-4BMW02-0317    | 38                                                    | 93                            | 102                            |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | 40                                                    | 91                            | 100                            |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | 49                                                    | 90                            | 96                             |
| 320-26324-4        | MEAFF-4BMW03-0317    | 37                                                    | 89                            | 97                             |
| 320-26324-5        | MEAFF-EB03-GW-0317   | 106                                                   | 90                            | 99                             |
| 320-26324-6        | MEAFF-EB04-GW-0317   | 101                                                   | 90                            | 95                             |
| LCS 320-154076/2-A | Lab Control Sample   | 100                                                   | 91                            | 95                             |
| MB 320-154076/1-A  | Method Blank         | 105                                                   | 88                            | 95                             |

### Surrogate Legend

<sup>13</sup>C4 PFOA = <sup>13</sup>C4 PFOA  
<sup>13</sup>C4 PFOS = <sup>13</sup>C4 PFOS  
<sup>18</sup>O2 PFHxS = <sup>18</sup>O2 PFHxS



# QC Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)

Lab Sample ID: MB 320-153806/1-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         | MB Result    | MB Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|--------------|--------------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.50         | U            | 1.0     | 0.20 | ug/L |   | 03/08/17 08:41 | 03/14/17 20:43 | 1       |
| Surrogate       | MB %Recovery | MB Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 69           |              | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/14/17 20:43 | 1       |

Lab Sample ID: LCS 320-153806/2-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         | Spike Added   | LCS Result    | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |  |  |
|-----------------|---------------|---------------|---------------|------|---|------|--------------|--|--|
| 1,4-Dioxane     | 10.0          | 3.17          | M             | ug/L |   | 32   | 12 - 52      |  |  |
| Surrogate       | LCS %Recovery | LCS Qualifier | Limits        |      |   |      |              |  |  |
| Nitrobenzene-d5 | 75            |               | 42 - 91       |      |   |      |              |  |  |

Lab Sample ID: LCSD 320-153806/3-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         | Spike Added    | LCSD Result    | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|-----------------|----------------|----------------|----------------|------|---|------|--------------|-----|-----------|
| 1,4-Dioxane     | 10.0           | 3.12           | M              | ug/L |   | 31   | 12 - 52      | 2   | 20        |
| Surrogate       | LCSD %Recovery | LCSD Qualifier | Limits         |      |   |      |              |     |           |
| Nitrobenzene-d5 | 71             |                | 42 - 91        |      |   |      |              |     |           |

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-154076/1-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | MB Result    | MB Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|--------------|--------------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 2.0          | U M          | 2.5      | 0.75 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 3.0          | U            | 4.0      | 1.3  | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 2.0          | U            | 2.5      | 0.92 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Isotope Dilution                    | MB %Recovery | MB Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 105          |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| 13C4 PFOS                           | 88           |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| 18O2 PFHxS                          | 95           |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |

Lab Sample ID: LCS 320-154076/2-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                       | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |  |  |
|-------------------------------|-------------|------------|---------------|------|---|------|--------------|--|--|
| Perfluorooctanoic acid (PFOA) | 40.0        | 45.1       |               | ng/L |   | 113  | 60 - 140     |  |  |

TestAmerica Sacramento

# QC Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-154076/2-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Spike Added      | LCS Result           | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|-------------------------------------|------------------|----------------------|---------------|------|---|------|--------------|
| Perfluorooctanesulfonic acid (PFOS) | 37.1             | 42.1                 | M             | ng/L |   | 113  | 60 - 140     |
| Perfluorobutanesulfonic acid (PFBS) | 35.4             | 44.5                 |               | ng/L |   | 126  | 50 - 150     |
| <b>Isotope Dilution</b>             | <b>%Recovery</b> | <b>LCS Qualifier</b> | <b>Limits</b> |      |   |      |              |
| 13C4 PFOA                           | 100              |                      | 25 - 150      |      |   |      |              |
| 13C4 PFOS                           | 91               |                      | 25 - 150      |      |   |      |              |
| 18O2 PFHxS                          | 95               |                      | 25 - 150      |      |   |      |              |

Lab Sample ID: 320-26324-3 MS

Matrix: Water

Analysis Batch: 154520

Client Sample ID: MEAFF-4BMW02-0317-MS

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Sample Result    | Sample Qualifier    | Spike Added   | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|-------------------------------------|------------------|---------------------|---------------|-----------|--------------|------|---|------|--------------|
| Perfluorooctanoic acid (PFOA)       | 1.9              | U M                 | 37.4          | 41.0      |              | ng/L |   | 109  | 60 - 140     |
| Perfluorooctanesulfonic acid (PFOS) | 2.8              | U M                 | 34.7          | 40.3      | M            | ng/L |   | 116  | 60 - 140     |
| Perfluorobutanesulfonic acid (PFBS) | 1.9              | U                   | 33.1          | 38.8      |              | ng/L |   | 117  | 50 - 150     |
| <b>Isotope Dilution</b>             | <b>%Recovery</b> | <b>MS Qualifier</b> | <b>Limits</b> |           |              |      |   |      |              |
| 13C4 PFOA                           | 40               |                     | 25 - 150      |           |              |      |   |      |              |
| 13C4 PFOS                           | 91               |                     | 25 - 150      |           |              |      |   |      |              |
| 18O2 PFHxS                          | 100              |                     | 25 - 150      |           |              |      |   |      |              |

Lab Sample ID: 320-26324-3 MSD

Matrix: Water

Analysis Batch: 154520

Client Sample ID: MEAFF-4BMW02-0317-SD

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Sample Result    | Sample Qualifier     | Spike Added   | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | Limit |
|-------------------------------------|------------------|----------------------|---------------|------------|---------------|------|---|------|--------------|-----|-------|
| Perfluorooctanoic acid (PFOA)       | 1.9              | U M                  | 37.2          | 40.4       |               | ng/L |   | 109  | 60 - 140     | 1   | 30    |
| Perfluorooctanesulfonic acid (PFOS) | 2.8              | U M                  | 34.6          | 39.8       | M             | ng/L |   | 115  | 60 - 140     | 1   | 30    |
| Perfluorobutanesulfonic acid (PFBS) | 1.9              | U                    | 32.9          | 41.2       |               | ng/L |   | 125  | 50 - 150     | 6   | 30    |
| <b>Isotope Dilution</b>             | <b>%Recovery</b> | <b>MSD Qualifier</b> | <b>Limits</b> |            |               |      |   |      |              |     |       |
| 13C4 PFOA                           | 49               |                      | 25 - 150      |            |               |      |   |      |              |     |       |
| 13C4 PFOS                           | 90               |                      | 25 - 150      |            |               |      |   |      |              |     |       |
| 18O2 PFHxS                          | 96               |                      | 25 - 150      |            |               |      |   |      |              |     |       |

TestAmerica Sacramento

# QC Association Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## GC/MS Semi VOA

### Prep Batch: 153806

| Lab Sample ID       | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|---------------------|------------------------|-----------|--------|--------|------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | Total/NA  | Water  | 3510C  |            |
| 320-26324-6         | MEAFF-EB04-GW-0317     | Total/NA  | Water  | 3510C  |            |
| MB 320-153806/1-A   | Method Blank           | Total/NA  | Water  | 3510C  |            |
| LCS 320-153806/2-A  | Lab Control Sample     | Total/NA  | Water  | 3510C  |            |
| LCSD 320-153806/3-A | Lab Control Sample Dup | Total/NA  | Water  | 3510C  |            |

### Analysis Batch: 154875

| Lab Sample ID       | Client Sample ID       | Prep Type | Matrix | Method     | Prep Batch |
|---------------------|------------------------|-----------|--------|------------|------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| 320-26324-6         | MEAFF-EB04-GW-0317     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| MB 320-153806/1-A   | Method Blank           | Total/NA  | Water  | WS-MS-0011 | 153806     |
| LCS 320-153806/2-A  | Lab Control Sample     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| LCSD 320-153806/3-A | Lab Control Sample Dup | Total/NA  | Water  | WS-MS-0011 | 153806     |

## LCMS

### Prep Batch: 154076

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method | Prep Batch |
|--------------------|----------------------|-----------|--------|--------|------------|
| 320-26324-1        | MEAFF-4DMW01-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-2 - DL   | MEAFF-4DMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-2        | MEAFF-4DMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-3        | MEAFF-4BMW02-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-4        | MEAFF-4BMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-5        | MEAFF-EB03-GW-0317   | Total/NA  | Water  | 3535   |            |
| 320-26324-6        | MEAFF-EB04-GW-0317   | Total/NA  | Water  | 3535   |            |
| MB 320-154076/1-A  | Method Blank         | Total/NA  | Water  | 3535   |            |
| LCS 320-154076/2-A | Lab Control Sample   | Total/NA  | Water  | 3535   |            |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | Total/NA  | Water  | 3535   |            |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | Total/NA  | Water  | 3535   |            |

### Analysis Batch: 154520

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method         | Prep Batch |
|--------------------|----------------------|-----------|--------|----------------|------------|
| 320-26324-1        | MEAFF-4DMW01-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-2        | MEAFF-4DMW03-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3        | MEAFF-4BMW02-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-4        | MEAFF-4BMW03-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-5        | MEAFF-EB03-GW-0317   | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-6        | MEAFF-EB04-GW-0317   | Total/NA  | Water  | 537 (Modified) | 154076     |
| MB 320-154076/1-A  | Method Blank         | Total/NA  | Water  | 537 (Modified) | 154076     |
| LCS 320-154076/2-A | Lab Control Sample   | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | Total/NA  | Water  | 537 (Modified) | 154076     |

### Analysis Batch: 155237

| Lab Sample ID    | Client Sample ID  | Prep Type | Matrix | Method         | Prep Batch |
|------------------|-------------------|-----------|--------|----------------|------------|
| 320-26324-2 - DL | MEAFF-4DMW03-0317 | Total/NA  | Water  | 537 (Modified) | 154076     |

TestAmerica Sacramento

# Lab Chronicle

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-4DMW01-0317**

**Date Collected: 03/03/17 10:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-1**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |            | 255 mL         | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 03:43       | TC1     | TAL SAC |

**Client Sample ID: MEAFF-4DMW03-0317**

**Date Collected: 03/03/17 10:50**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-2**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |            | 260.1 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 03:50       | TC1     | TAL SAC |
| Total/NA  | Prep       | 3535           | DL  |            | 260.1 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) | DL  | 10         |                |              | 155237       | 03/15/17 20:16       | SBC     | TAL SAC |

**Client Sample ID: MEAFF-4BMW02-0317**

**Date Collected: 03/03/17 13:05**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-3**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |            | 265.4 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 03:58       | TC1     | TAL SAC |

**Client Sample ID: MEAFF-4BMW03-0317**

**Date Collected: 03/03/17 15:15**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-4**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |            | 266.9 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 04:20       | TC1     | TAL SAC |

**Client Sample ID: MEAFF-EB03-GW-0317**

**Date Collected: 03/03/17 14:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-5**

**Matrix: Water**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3510C          |     |            | 883.4 mL       | 1.0 mL       | 153806       | 03/08/17 08:41       | SR1     | TAL SAC |
| Total/NA  | Analysis   | WS-MS-0011     |     | 1          |                |              | 154875       | 03/15/17 00:04       | A1C     | TAL SAC |
| Total/NA  | Prep       | 3535           |     |            | 264.8 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 04:28       | TC1     | TAL SAC |

TestAmerica Sacramento

# Lab Chronicle

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-EB04-GW-0317**

**Lab Sample ID: 320-26324-6**

**Date Collected: 03/03/17 15:35**

**Matrix: Water**

**Date Received: 03/04/17 09:15**

| Prep Type | Batch Type | Batch Method   | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|------------|----------------|--------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3510C          |     |            | 933.6 mL       | 1.0 mL       | 153806       | 03/08/17 08:41       | SR1     | TAL SAC |
| Total/NA  | Analysis   | WS-MS-0011     |     | 1          |                |              | 154875       | 03/15/17 00:27       | A1C     | TAL SAC |
| Total/NA  | Prep       | 3535           |     |            | 260.3 mL       | 0.5 mL       | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1          |                |              | 154520       | 03/12/17 04:35       | TC1     | TAL SAC |

## Laboratory References:

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

# Certification Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Laboratory: TestAmerica Sacramento

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

| Authority          | Program       | EPA Region | Certification ID | Expiration Date |
|--------------------|---------------|------------|------------------|-----------------|
| Alaska (UST)       | State Program | 10         | UST-055          | 12-18-17        |
| Arizona            | State Program | 9          | AZ0708           | 08-11-17        |
| Arkansas DEQ       | State Program | 6          | 88-0691          | 06-17-17        |
| California         | State Program | 9          | 2897             | 01-31-18        |
| Colorado           | State Program | 8          | CA00044          | 08-31-17        |
| Connecticut        | State Program | 1          | PH-0691          | 06-30-17        |
| Florida            | NELAP         | 4          | E87570           | 06-30-17        |
| Hawaii             | State Program | 9          | N/A              | 01-29-18        |
| Illinois           | NELAP         | 5          | 200060           | 03-17-18        |
| Kansas             | NELAP         | 7          | E-10375          | 10-31-17        |
| L-A-B              | DoD ELAP      |            | L2468            | 01-20-18        |
| Louisiana          | NELAP         | 6          | 30612            | 06-30-17        |
| Maine              | State Program | 1          | CA0004           | 04-18-18        |
| Michigan           | State Program | 5          | 9947             | 01-31-18        |
| Nevada             | State Program | 9          | CA00044          | 07-31-17        |
| New Jersey         | NELAP         | 2          | CA005            | 06-30-17        |
| New York           | NELAP         | 2          | 11666            | 04-01-17 *      |
| Oregon             | NELAP         | 10         | 4040             | 01-28-18        |
| Pennsylvania       | NELAP         | 3          | 68-01272         | 03-31-17 *      |
| Texas              | NELAP         | 6          | T104704399       | 07-31-17        |
| US Fish & Wildlife | Federal       |            | LE148388-0       | 10-31-17        |
| USDA               | Federal       |            | P330-11-00436    | 12-30-17        |
| USEPA UCMR         | Federal       | 1          | CA00044          | 11-06-18        |
| Utah               | NELAP         | 8          | CA00044          | 02-28-18        |
| Virginia           | NELAP         | 3          | 460278           | 03-14-18        |
| Washington         | State Program | 10         | C581             | 05-05-17        |
| West Virginia (DW) | State Program | 3          | 9930C            | 12-31-17        |
| Wyoming            | State Program | 8          | 8TMS-L           | 01-29-17 *      |

\* Certification renewal pending - certification considered valid.

TestAmerica Sacramento

## Method Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

| Method         | Method Description          | Protocol | Laboratory |
|----------------|-----------------------------|----------|------------|
| WS-MS-0011     | 1,4-Dioxane (GC/MS SIM)     | TAL SOP  | TAL SAC    |
| 537 (Modified) | Perfluorinated Hydrocarbons | EPA      | TAL SAC    |

### Protocol References:

EPA = US Environmental Protection Agency

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

### Laboratory References:

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

## Sample Summary

Client: CH2M Hill, Inc.

TestAmerica Job ID: 320-26324-1

Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

| Lab Sample ID | Client Sample ID   | Matrix | Collected      | Received       |
|---------------|--------------------|--------|----------------|----------------|
| 320-26324-1   | MEAFF-4DMW01-0317  | Water  | 03/03/17 10:00 | 03/04/17 09:15 |
| 320-26324-2   | MEAFF-4DMW03-0317  | Water  | 03/03/17 10:50 | 03/04/17 09:15 |
| 320-26324-3   | MEAFF-4BMW02-0317  | Water  | 03/03/17 13:05 | 03/04/17 09:15 |
| 320-26324-4   | MEAFF-4BMW03-0317  | Water  | 03/03/17 15:15 | 03/04/17 09:15 |
| 320-26324-5   | MEAFF-EB03-GW-0317 | Water  | 03/03/17 14:00 | 03/04/17 09:15 |
| 320-26324-6   | MEAFF-EB04-GW-0317 | Water  | 03/03/17 15:35 | 03/04/17 09:15 |



West Sacramento, CA 95605-1500  
phone 916.373.5600 fax 303.467.7248

**TestAmerica Laboratories, Inc.**

**Regulatory Program:** ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|---------------------------------------------------------------------|--------------------|-----------------------------------------------|---------------|----------------------------------------------|------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------|
| <b>Client Contact</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        | <b>Project Manager: Bryan Burkingstock</b>                          |                    | <b>Site Contact: Ryan Brown</b>               |               | <b>Date: 3/3/17</b>                          |                              | <b>COC No: 7</b>            |                                                                                                                  |
| <b>CH2M Hill</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        | <b>Tel/Fax:</b>                                                     |                    | <b>Lab Contact: Jill Kellmann</b>             |               | <b>Carrier: FedEx</b>                        |                              | <b>1 of 1 COCs</b>          |                                                                                                                  |
| 6600 Peachtree Dunwoody Rd., 400 Embassy Row, Suite 600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        | <input checked="" type="checkbox"/> <b>Analysis Turnaround Time</b> |                    | <input type="checkbox"/> <b>CALENDAR DAYS</b> |               | <input type="checkbox"/> <b>WORKING DAYS</b> |                              | <b>Sampler:</b>             |                                                                                                                  |
| Atlanta, GA 30328                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        | TAT if different from Below <b>20 days</b>                          |                    | <input type="checkbox"/> 2 weeks              |               | <input type="checkbox"/> 1 week              |                              | <b>For Lab Use Only:</b>    |                                                                                                                  |
| (678) 530-4060 Phone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        | <input type="checkbox"/> 2 days                                     |                    | <input type="checkbox"/> 1 day                |               | <input type="checkbox"/> 1 day               |                              | <b>Walk-in Client:</b>      |                                                                                                                  |
| (770) 604-9183 FAX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        | <input type="checkbox"/> 1 day                                      |                    |                                               |               |                                              |                              | <b>Lab Sampling:</b>        |                                                                                                                  |
| Project Name: Meridian 10006-7-105420 JMD1 Navy Clean                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                     |                    |                                               |               |                                              |                              | <b>Job / SDG No.:</b>       |                                                                                                                  |
| Site: NAS Meridian                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
| P.O. #: 10006-7-105420                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
| <b>Sample Identification</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        | <b>Sample Date</b>                                                  | <b>Sample Time</b> | <b>Sample Type (C=Comp, G=Grab)</b>           | <b>Matrix</b> | <b># of Cont.</b>                            | <b>Filtered Sample (Y/N)</b> | <b>Perform MS/MSD (Y/N)</b> | <b>Sample Specific Notes:</b>                                                                                    |
| MEAFF-4DHW01-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 3/3/17 | 10000                                                               | G                  | GL                                            | 2             | N                                            | X                            |                             | <br>320-26324 Chain of Custody |
| MEAFF-4DHW03-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        | 10500                                                               |                    |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-4DHW02-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        | 13005                                                               |                    |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-4DHW02-0317HS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |        |                                                                     |                    |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-4DHW02-0317-SN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        | 1515                                                                |                    |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-4DHW03-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |        | 1400                                                                |                    |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-EP03-GW-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        | 1535                                                                | V                  |                                               |               |                                              | X                            |                             |                                                                                                                  |
| MEAFF-EP04-GW-0317                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
| <p>① Time on bottle is 15:45 3/3/17</p> <p><b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other</p> <p><b>Possible Hazard Identification:</b> Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.</p> <p><input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input checked="" type="checkbox"/> Poison B <input type="checkbox"/> Unknown</p> <p><input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for Months</p> <p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b></p> |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
| <p><b>Special Instructions/OC Requirements &amp; Comments:</b><br/>                     send results to Mike Zambari - address should be on file                 </p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                                                                     |                    |                                               |               |                                              |                              |                             |                                                                                                                  |
| <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: 0.8          |               | <b>Corr'd:</b> 1.1                           |                              | <b>Therm ID No.:</b> ALK-1  |                                                                                                                  |
| Relinquished by: Ryan Brown                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        | Company: CH2M Hill                                                  |                    | Date/Time: 3/3/17 1700                        |               | Received by: [Signature]                     |                              | Company: [Signature]        |                                                                                                                  |
| Relinquished by:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        | Company:                                                            |                    | Date/Time:                                    |               | Received by:                                 |                              | Company:                    |                                                                                                                  |
| Relinquished by:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        | Company:                                                            |                    | Date/Time:                                    |               | Received in Laboratory by:                   |                              | Company:                    |                                                                                                                  |

# Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 320-26324-1

Login Number: 26324

List Number: 1

Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

| Question                                                                         | Answer | Comment                             |
|----------------------------------------------------------------------------------|--------|-------------------------------------|
| Radioactivity wasn't checked or is <=/ background as measured by a survey meter. | True   |                                     |
| The cooler's custody seal, if present, is intact.                                | True   |                                     |
| 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?                                      | False  |                                     |
| There are no discrepancies between the containers received and the COC.          | False  | Refer to Job Narrative for details. |
| 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 <6mm (1/4").  | True   |                                     |
| Multiphasic samples are not present.                                             | True   |                                     |
| Samples do not require splitting or compositing.                                 | True   |                                     |
| Residual Chlorine Checked.                                                       | N/A    |                                     |

## ANALYTICAL REPORT

Job Number: 320-26324-1

Job Description: Meridian 10006-7-105420 JM01 Navy Clean

For:  
CH2M Hill, Inc.  
2411 Dulles Corner Park  
Suite 500  
Herndon, VA 20171  
Attention: Mr. Michael Zamboni



Approved for release.  
Jill Kellmann  
Manager of Project Management  
3/29/2017 5:34 PM

---

Jill Kellmann, Manager of Project Management  
880 Riverside Parkway, West Sacramento, CA, 95605  
(916)374-4402  
jill.kellmann@testamericainc.com  
03/29/2017  
Revision: 1

# Table of Contents

|                                        |     |
|----------------------------------------|-----|
| Cover Title Page . . . . .             | 1   |
| Data Summaries . . . . .               | 4   |
| Definitions . . . . .                  | 4   |
| Case Narrative . . . . .               | 5   |
| Detection Summary . . . . .            | 7   |
| Client Sample Results . . . . .        | 8   |
| Default Detection Limits . . . . .     | 11  |
| Surrogate Summary . . . . .            | 12  |
| Isotope Dilution Summary . . . . .     | 13  |
| QC Sample Results . . . . .            | 14  |
| QC Association . . . . .               | 16  |
| Chronicle . . . . .                    | 17  |
| Certification Summary . . . . .        | 19  |
| Method Summary . . . . .               | 20  |
| Sample Summary . . . . .               | 21  |
| Manual Integration Summary . . . . .   | 22  |
| Reagent Traceability . . . . .         | 32  |
| COAs . . . . .                         | 62  |
| Organic Sample Data . . . . .          | 317 |
| GC/MS Semi VOA . . . . .               | 317 |
| Method 8270C SIM . . . . .             | 317 |
| Method 8270C SIM QC Summary . . . . .  | 318 |
| Method 8270C SIM Sample Data . . . . . | 323 |
| Standards Data . . . . .               | 331 |
| Method 8270C SIM ICAL Data . . . . .   | 331 |
| Method 8270C SIM CCAL Data . . . . .   | 361 |

# Table of Contents

|                                        |     |
|----------------------------------------|-----|
| Raw QC Data .....                      | 373 |
| Method 8270C SIM Blank Data .....      | 373 |
| Method 8270C SIM LCS/LCSD Data .....   | 377 |
| Method 8270C SIM Run Logs .....        | 387 |
| Method 8270C SIM Prep Data .....       | 389 |
| LCMS .....                             | 418 |
| Method PFC DOD .....                   | 418 |
| Method PFC DOD QC Summary .....        | 419 |
| Method PFC DOD Sample Data .....       | 424 |
| Standards Data .....                   | 468 |
| Method PFC DOD ICAL Data .....         | 468 |
| Method PFC DOD CCAL Data .....         | 539 |
| Raw QC Data .....                      | 616 |
| Method PFC DOD Blank Data .....        | 616 |
| Method PFC DOD LCS/LCSD Data .....     | 627 |
| Method PFC DOD MS/MSD Data .....       | 637 |
| Method PFC DOD Run Logs .....          | 659 |
| Method PFC DOD Prep Data .....         | 664 |
| Shipping and Receiving Documents ..... | 689 |
| Client Chain of Custody .....          | 690 |
| Sample Receipt Checklist .....         | 691 |

# Definitions/Glossary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description                 |
|-----------|---------------------------------------|
| U         | Undetected at the Limit of Detection. |
| M         | Manual integrated compound.           |

### LCMS

| Qualifier | Qualifier Description                                                               |
|-----------|-------------------------------------------------------------------------------------|
| M         | Manual integrated compound.                                                         |
| E         | Result exceeded calibration range.                                                  |
| D         | The reported value is from a dilution.                                              |
| J         | Estimated: The analyte was positively identified; the quantitation is an estimation |
| U         | Undetected at the Limit of Detection.                                               |

## 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, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC            | Decision level concentration                                                                                |
| MDA            | Minimum detectable activity                                                                                 |
| EDL            | Estimated Detection Limit                                                                                   |
| MDC            | Minimum detectable concentration                                                                            |
| 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                                                                                        |
| 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)                                                                       |

## CASE NARRATIVE

Client: CH2M Hill, Inc.

Project: Meridian 10006-7-105420 JM01 Navy Clean

Report Number: 320-26324-1

### Revision - March 27, 2017

Revision created to include PFBS in the method 537 Mod analyte list.

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica West Sacramento attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

TestAmerica utilizes USEPA approved methods and DOD QSM, where applicable, in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. A summary of QC data for these analyses is included at the back of the report.

All parameters for which TestAmerica West Sacramento has certification were evaluated to the QSM specified reporting convention or to the client specified format if different from QSM. Parameters not certified under QSM, if any, were evaluated to the detection limit (DL) and include qualified results where applicable.

The sample(s) that contain constituents flagged with U are undetected. The result associated with this flag is the limit of detection (LOD).

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

### RECEIPT

The samples were received on 03/04/2017; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.1 C.

### **Receipt Exceptions**

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): MEAFF-EB04-GW-0317 (320-26324-6). The container time lists 15:45, while the COC lists 15:35.

No sample time noted (however sample is an MS/MSD thus time is entered via parent sample). MEAFF-4BMW02-0317-MS (320-26324-3[MS]) and MEAFF-4BMW02-0317-SD (320-26324-3[MSD])

### 1,4-DIOXANE

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

### PFAS

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.

The following sample was diluted to bring the concentration of target analytes within the calibration range: MEAFF-4DMW03-0317 (320-26324-2). Elevated reporting limits (RLs) are provided.

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





## Detection Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

### Client Sample ID: MEAFF-4DMW01-0317

### Lab Sample ID: 320-26324-1

| Analyte                             | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|-------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorooctanoic acid (PFOA)       | 220    | M         | 2.5 | 0.73 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS) | 210    | M         | 3.9 | 1.3  | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) | 11     |           | 2.5 | 0.90 | ng/L | 1       |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-4DMW03-0317

### Lab Sample ID: 320-26324-2

| Analyte                                  | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|------------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorooctanoic acid (PFOA)            | 360    | M         | 2.4 | 0.72 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS)      | 1100   | M E       | 3.8 | 1.2  | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS)      | 15     | M         | 2.4 | 0.88 | ng/L | 1       |   | 537 (Modified) | Total/NA  |
| Perfluorooctanoic acid (PFOA) - DL       | 390    | D M       | 24  | 7.2  | ng/L | 10      |   | 537 (Modified) | Total/NA  |
| Perfluorooctanesulfonic acid (PFOS) - DL | 1100   | D         | 38  | 12   | ng/L | 10      |   | 537 (Modified) | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) - DL | 16     | J D M     | 24  | 8.8  | ng/L | 10      |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-4BMW02-0317

### Lab Sample ID: 320-26324-3

No Detections.

### Client Sample ID: MEAFF-4BMW03-0317

### Lab Sample ID: 320-26324-4

| Analyte                             | Result | Qualifier | LOQ | DL   | Unit | Dil Fac | D | Method         | Prep Type |
|-------------------------------------|--------|-----------|-----|------|------|---------|---|----------------|-----------|
| Perfluorobutanesulfonic acid (PFBS) | 4.3    |           | 2.3 | 0.86 | ng/L | 1       |   | 537 (Modified) | Total/NA  |

### Client Sample ID: MEAFF-EB03-GW-0317

### Lab Sample ID: 320-26324-5

No Detections.

### Client Sample ID: MEAFF-EB04-GW-0317

### Lab Sample ID: 320-26324-6

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-4DMW01-0317**

**Date Collected: 03/03/17 10:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-1**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 220       | M         | 2.5      | 0.73 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 210       | M         | 3.9      | 1.3  | ng/L | — | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 11        |           | 2.5      | 0.90 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 67        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |
| 18O2 PFHxS                          | 91        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:43 | 1       |

**Client Sample ID: MEAFF-4DMW03-0317**

**Date Collected: 03/03/17 10:50**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-2**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 360       | M         | 2.4      | 0.72 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 1100      | M E       | 3.8      | 1.2  | ng/L | — | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 15        | M         | 2.4      | 0.88 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 69        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| 13C4 PFOS                           | 76        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |
| 18O2 PFHxS                          | 83        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:50 | 1       |

## Method: 537 (Modified) - Perfluorinated Hydrocarbons - DL

| Analyte                             | Result    | Qualifier | LOQ      | DL  | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|-----|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 390       | D M       | 24       | 7.2 | ng/L | — | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Perfluorooctanesulfonic acid (PFOS) | 1100      | D         | 38       | 12  | ng/L | — | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Perfluorobutanesulfonic acid (PFBS) | 16        | J D M     | 24       | 8.8 | ng/L | — | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |     |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 93        |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| 13C4 PFOS                           | 100       |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |
| 18O2 PFHxS                          | 113       |           | 25 - 150 |     |      |   | 03/09/17 10:15 | 03/15/17 20:16 | 10      |

**Client Sample ID: MEAFF-4BMW02-0317**

**Date Collected: 03/03/17 13:05**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-3**

**Matrix: Water**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U M       | 2.4      | 0.70 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U M       | 3.8      | 1.2  | ng/L | — | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.86 | ng/L | — | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 38        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |
| 13C4 PFOS                           | 93        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:58 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-4BMW02-0317**

**Date Collected: 03/03/17 13:05**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-3**

**Matrix: Water**

**Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)**

| Isotope Dilution | %Recovery | Qualifier | Limits   | Prepared       | Analyzed       | Dil Fac |
|------------------|-----------|-----------|----------|----------------|----------------|---------|
| 18O2 PFHxS       | 102       |           | 25 - 150 | 03/09/17 10:15 | 03/12/17 03:58 | 1       |

**Client Sample ID: MEAFF-4BMW03-0317**

**Date Collected: 03/03/17 15:15**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-4**

**Matrix: Water**

**Method: 537 (Modified) - Perfluorinated Hydrocarbons**

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.3      | 0.70 | ng/L | — | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U         | 3.7      | 1.2  | ng/L | — | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 4.3       |           | 2.3      | 0.86 | ng/L | — | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 37        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| 13C4 PFOS                           | 89        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |
| 18O2 PFHxS                          | 97        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:20 | 1       |

**Client Sample ID: MEAFF-EB03-GW-0317**

**Date Collected: 03/03/17 14:00**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-5**

**Matrix: Water**

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

| Analyte         | Result    | Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|-----------|-----------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.57      | U         | 1.1     | 0.23 | ug/L | — | 03/08/17 08:41 | 03/15/17 00:04 | 1       |
| Surrogate       | %Recovery | Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 76        |           | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/15/17 00:04 | 1       |

**Method: 537 (Modified) - Perfluorinated Hydrocarbons**

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.4      | 0.71 | ng/L | — | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.8       | U         | 3.8      | 1.2  | ng/L | — | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.87 | ng/L | — | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 106       |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |
| 18O2 PFHxS                          | 99        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:28 | 1       |

**Client Sample ID: MEAFF-EB04-GW-0317**

**Date Collected: 03/03/17 15:35**

**Date Received: 03/04/17 09:15**

**Lab Sample ID: 320-26324-6**

**Matrix: Water**

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

| Analyte         | Result    | Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|-----------|-----------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.54      | U         | 1.1     | 0.21 | ug/L |   | 03/08/17 08:41 | 03/15/17 00:27 | 1       |
| Surrogate       | %Recovery | Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 74        |           | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/15/17 00:27 | 1       |

TestAmerica Sacramento

# Client Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-EB04-GW-0317**

**Lab Sample ID: 320-26324-6**

**Date Collected: 03/03/17 15:35**

**Matrix: Water**

**Date Received: 03/04/17 09:15**

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

| Analyte                             | Result    | Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|-----------|-----------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 1.9       | U         | 2.4      | 0.72 | ng/L |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 2.9       | U         | 3.8      | 1.2  | ng/L |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 1.9       | U         | 2.4      | 0.88 | ng/L |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| Isotope Dilution                    | %Recovery | Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 101       |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| 13C4 PFOS                           | 90        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |
| 18O2 PFHxS                          | 95        |           | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 04:35 | 1       |

## Default Detection Limits

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

### Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)

Prep: 3510C

| Analyte     | LOQ | DL   | Units | Method     |
|-------------|-----|------|-------|------------|
| 1,4-Dioxane | 1.0 | 0.20 | ug/L  | WS-MS-0011 |

### Method: 537 (Modified) - Perfluorinated Hydrocarbons

Prep: 3535

| Analyte                             | LOQ | DL   | Units | Method         |
|-------------------------------------|-----|------|-------|----------------|
| Perfluorobutanesulfonic acid (PFBS) | 2.5 | 0.92 | ng/L  | 537 (Modified) |
| Perfluorooctanesulfonic acid (PFOS) | 4.0 | 1.3  | ng/L  | 537 (Modified) |
| Perfluorooctanoic acid (PFOA)       | 2.5 | 0.75 | ng/L  | 537 (Modified) |

# Surrogate Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)**

**Matrix: Water**

**Prep Type: Total/NA**

## Percent Surrogate Recovery (Acceptance Limits)

| Lab Sample ID       | Client Sample ID       | NBZ<br>(42-91) |
|---------------------|------------------------|----------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | 76             |
| 320-26324-6         | MEAFF-EB04-GW-0317     | 74             |
| LCS 320-153806/2-A  | Lab Control Sample     | 75             |
| LCSD 320-153806/3-A | Lab Control Sample Dup | 71             |
| MB 320-153806/1-A   | Method Blank           | 69             |

### Surrogate Legend

NBZ = Nitrobenzene-d5

# Isotope Dilution Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

Matrix: Water

Prep Type: Total/NA

| Lab Sample ID      | Client Sample ID     | Percent Isotope Dilution Recovery (Acceptance Limits) |                      |                      |  |  |  |  |
|--------------------|----------------------|-------------------------------------------------------|----------------------|----------------------|--|--|--|--|
|                    |                      | 3C4 PFO/<br>(25-150)                                  | 3C4 PFO/<br>(25-150) | 3O2 PFHx<br>(25-150) |  |  |  |  |
| 320-26324-1        | MEAFF-4DMW01-0317    | 67                                                    | 90                   | 91                   |  |  |  |  |
| 320-26324-2        | MEAFF-4DMW03-0317    | 69                                                    | 76                   | 83                   |  |  |  |  |
| 320-26324-2 - DL   | MEAFF-4DMW03-0317    | 93                                                    | 100                  | 113                  |  |  |  |  |
| 320-26324-3        | MEAFF-4BMW02-0317    | 38                                                    | 93                   | 102                  |  |  |  |  |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | 40                                                    | 91                   | 100                  |  |  |  |  |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | 49                                                    | 90                   | 96                   |  |  |  |  |
| 320-26324-4        | MEAFF-4BMW03-0317    | 37                                                    | 89                   | 97                   |  |  |  |  |
| 320-26324-5        | MEAFF-EB03-GW-0317   | 106                                                   | 90                   | 99                   |  |  |  |  |
| 320-26324-6        | MEAFF-EB04-GW-0317   | 101                                                   | 90                   | 95                   |  |  |  |  |
| LCS 320-154076/2-A | Lab Control Sample   | 100                                                   | 91                   | 95                   |  |  |  |  |
| MB 320-154076/1-A  | Method Blank         | 105                                                   | 88                   | 95                   |  |  |  |  |

### Surrogate Legend

13C4 PFOA = 13C4 PFOA

13C4 PFOS = 13C4 PFOS

18O2 PFHxS = 18O2 PFHxS

# QC Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: WS-MS-0011 - 1,4-Dioxane (GC/MS SIM)

Lab Sample ID: MB 320-153806/1-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         | MB Result    | MB Qualifier | LOQ     | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-----------------|--------------|--------------|---------|------|------|---|----------------|----------------|---------|
| 1,4-Dioxane     | 0.50         | U            | 1.0     | 0.20 | ug/L |   | 03/08/17 08:41 | 03/14/17 20:43 | 1       |
| Surrogate       | MB %Recovery | MB Qualifier | Limits  |      |      |   | Prepared       | Analyzed       | Dil Fac |
| Nitrobenzene-d5 | 69           |              | 42 - 91 |      |      |   | 03/08/17 08:41 | 03/14/17 20:43 | 1       |

Lab Sample ID: LCS 320-153806/2-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         |               | Spike Added   | LCS Result | LCS Qualifier | Unit | D | %Rec | Limits  |  |
|-----------------|---------------|---------------|------------|---------------|------|---|------|---------|--|
| 1,4-Dioxane     |               | 10.0          | 3.17       | M             | ug/L |   | 32   | 12 - 52 |  |
| Surrogate       | LCS %Recovery | LCS Qualifier | Limits     |               |      |   |      |         |  |
| Nitrobenzene-d5 | 75            |               | 42 - 91    |               |      |   |      |         |  |

Lab Sample ID: LCSD 320-153806/3-A

Matrix: Water

Analysis Batch: 154875

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 153806

| Analyte         |                | Spike Added    | LCSD Result | LCSD Qualifier | Unit | D | %Rec | Limits  | RPD | Limit |
|-----------------|----------------|----------------|-------------|----------------|------|---|------|---------|-----|-------|
| 1,4-Dioxane     |                | 10.0           | 3.12        | M              | ug/L |   | 31   | 12 - 52 | 2   | 20    |
| Surrogate       | LCSD %Recovery | LCSD Qualifier | Limits      |                |      |   |      |         |     |       |
| Nitrobenzene-d5 | 71             |                | 42 - 91     |                |      |   |      |         |     |       |

## Method: 537 (Modified) - Perfluorinated Hydrocarbons

Lab Sample ID: MB 320-154076/1-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | MB Result    | MB Qualifier | LOQ      | DL   | Unit | D | Prepared       | Analyzed       | Dil Fac |
|-------------------------------------|--------------|--------------|----------|------|------|---|----------------|----------------|---------|
| Perfluorooctanoic acid (PFOA)       | 2.0          | U M          | 2.5      | 0.75 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Perfluorooctanesulfonic acid (PFOS) | 3.0          | U            | 4.0      | 1.3  | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Perfluorobutanesulfonic acid (PFBS) | 2.0          | U            | 2.5      | 0.92 | ng/L |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| Isotope Dilution                    | MB %Recovery | MB Qualifier | Limits   |      |      |   | Prepared       | Analyzed       | Dil Fac |
| 13C4 PFOA                           | 105          |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| 13C4 PFOS                           | 88           |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |
| 18O2 PFHxS                          | 95           |              | 25 - 150 |      |      |   | 03/09/17 10:15 | 03/12/17 03:28 | 1       |

Lab Sample ID: LCS 320-154076/2-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                       |  | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | Limits   |  |
|-------------------------------|--|-------------|------------|---------------|------|---|------|----------|--|
| Perfluorooctanoic acid (PFOA) |  | 40.0        | 45.1       |               | ng/L |   | 113  | 60 - 140 |  |

TestAmerica Sacramento



# QC Sample Results

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Method: 537 (Modified) - Perfluorinated Hydrocarbons (Continued)

Lab Sample ID: LCS 320-154076/2-A

Matrix: Water

Analysis Batch: 154520

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Spike Added   | LCS Result    | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|-------------------------------------|---------------|---------------|---------------|------|---|------|--------------|
| Perfluorooctanesulfonic acid (PFOS) | 37.1          | 42.1          | M             | ng/L |   | 113  | 60 - 140     |
| Perfluorobutanesulfonic acid (PFBS) | 35.4          | 44.5          |               | ng/L |   | 126  | 50 - 150     |
| Isotope Dilution                    | LCS %Recovery | LCS Qualifier | Limits        |      |   |      |              |
| 13C4 PFOA                           | 100           |               | 25 - 150      |      |   |      |              |
| 13C4 PFOS                           | 91            |               | 25 - 150      |      |   |      |              |
| 18O2 PFHxS                          | 95            |               | 25 - 150      |      |   |      |              |

Lab Sample ID: 320-26324-3 MS

Matrix: Water

Analysis Batch: 154520

Client Sample ID: MEAFF-4BMW02-0317-MS

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|-------------------------------------|---------------|------------------|-------------|-----------|--------------|------|---|------|--------------|
| Perfluorooctanoic acid (PFOA)       | 1.9           | U M              | 37.4        | 41.0      |              | ng/L |   | 109  | 60 - 140     |
| Perfluorooctanesulfonic acid (PFOS) | 2.8           | U M              | 34.7        | 40.3      | M            | ng/L |   | 116  | 60 - 140     |
| Perfluorobutanesulfonic acid (PFBS) | 1.9           | U                | 33.1        | 38.8      |              | ng/L |   | 117  | 50 - 150     |
| Isotope Dilution                    | MS %Recovery  | MS Qualifier     | Limits      |           |              |      |   |      |              |
| 13C4 PFOA                           | 40            |                  | 25 - 150    |           |              |      |   |      |              |
| 13C4 PFOS                           | 91            |                  | 25 - 150    |           |              |      |   |      |              |
| 18O2 PFHxS                          | 100           |                  | 25 - 150    |           |              |      |   |      |              |

Lab Sample ID: 320-26324-3 MSD

Matrix: Water

Analysis Batch: 154520

Client Sample ID: MEAFF-4BMW02-0317-SD

Prep Type: Total/NA

Prep Batch: 154076

| Analyte                             | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | Limit |
|-------------------------------------|---------------|------------------|-------------|------------|---------------|------|---|------|--------------|-----|-------|
| Perfluorooctanoic acid (PFOA)       | 1.9           | U M              | 37.2        | 40.4       |               | ng/L |   | 109  | 60 - 140     | 1   | 30    |
| Perfluorooctanesulfonic acid (PFOS) | 2.8           | U M              | 34.6        | 39.8       | M             | ng/L |   | 115  | 60 - 140     | 1   | 30    |
| Perfluorobutanesulfonic acid (PFBS) | 1.9           | U                | 32.9        | 41.2       |               | ng/L |   | 125  | 50 - 150     | 6   | 30    |
| Isotope Dilution                    | MSD %Recovery | MSD Qualifier    | Limits      |            |               |      |   |      |              |     |       |
| 13C4 PFOA                           | 49            |                  | 25 - 150    |            |               |      |   |      |              |     |       |
| 13C4 PFOS                           | 90            |                  | 25 - 150    |            |               |      |   |      |              |     |       |
| 18O2 PFHxS                          | 96            |                  | 25 - 150    |            |               |      |   |      |              |     |       |

# QC Association Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## GC/MS Semi VOA

### Prep Batch: 153806

| Lab Sample ID       | Client Sample ID       | Prep Type | Matrix | Method | Prep Batch |
|---------------------|------------------------|-----------|--------|--------|------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | Total/NA  | Water  | 3510C  |            |
| 320-26324-6         | MEAFF-EB04-GW-0317     | Total/NA  | Water  | 3510C  |            |
| MB 320-153806/1-A   | Method Blank           | Total/NA  | Water  | 3510C  |            |
| LCS 320-153806/2-A  | Lab Control Sample     | Total/NA  | Water  | 3510C  |            |
| LCSD 320-153806/3-A | Lab Control Sample Dup | Total/NA  | Water  | 3510C  |            |

### Analysis Batch: 154875

| Lab Sample ID       | Client Sample ID       | Prep Type | Matrix | Method     | Prep Batch |
|---------------------|------------------------|-----------|--------|------------|------------|
| 320-26324-5         | MEAFF-EB03-GW-0317     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| 320-26324-6         | MEAFF-EB04-GW-0317     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| MB 320-153806/1-A   | Method Blank           | Total/NA  | Water  | WS-MS-0011 | 153806     |
| LCS 320-153806/2-A  | Lab Control Sample     | Total/NA  | Water  | WS-MS-0011 | 153806     |
| LCSD 320-153806/3-A | Lab Control Sample Dup | Total/NA  | Water  | WS-MS-0011 | 153806     |

## LCMS

### Prep Batch: 154076

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method | Prep Batch |
|--------------------|----------------------|-----------|--------|--------|------------|
| 320-26324-1        | MEAFF-4DMW01-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-2 - DL   | MEAFF-4DMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-2        | MEAFF-4DMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-3        | MEAFF-4BMW02-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-4        | MEAFF-4BMW03-0317    | Total/NA  | Water  | 3535   |            |
| 320-26324-5        | MEAFF-EB03-GW-0317   | Total/NA  | Water  | 3535   |            |
| 320-26324-6        | MEAFF-EB04-GW-0317   | Total/NA  | Water  | 3535   |            |
| MB 320-154076/1-A  | Method Blank         | Total/NA  | Water  | 3535   |            |
| LCS 320-154076/2-A | Lab Control Sample   | Total/NA  | Water  | 3535   |            |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | Total/NA  | Water  | 3535   |            |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | Total/NA  | Water  | 3535   |            |

### Analysis Batch: 154520

| Lab Sample ID      | Client Sample ID     | Prep Type | Matrix | Method         | Prep Batch |
|--------------------|----------------------|-----------|--------|----------------|------------|
| 320-26324-1        | MEAFF-4DMW01-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-2        | MEAFF-4DMW03-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3        | MEAFF-4BMW02-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-4        | MEAFF-4BMW03-0317    | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-5        | MEAFF-EB03-GW-0317   | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-6        | MEAFF-EB04-GW-0317   | Total/NA  | Water  | 537 (Modified) | 154076     |
| MB 320-154076/1-A  | Method Blank         | Total/NA  | Water  | 537 (Modified) | 154076     |
| LCS 320-154076/2-A | Lab Control Sample   | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3 MS     | MEAFF-4BMW02-0317-MS | Total/NA  | Water  | 537 (Modified) | 154076     |
| 320-26324-3 MSD    | MEAFF-4BMW02-0317-SD | Total/NA  | Water  | 537 (Modified) | 154076     |

### Analysis Batch: 155237

| Lab Sample ID    | Client Sample ID  | Prep Type | Matrix | Method         | Prep Batch |
|------------------|-------------------|-----------|--------|----------------|------------|
| 320-26324-2 - DL | MEAFF-4DMW03-0317 | Total/NA  | Water  | 537 (Modified) | 154076     |

# Lab Chronicle

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Client Sample ID: MEAFF-4DMW01-0317

Date Collected: 03/03/17 10:00

Date Received: 03/04/17 09:15

## Lab Sample ID: 320-26324-1

Matrix: Water

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 03:43       | TC1     | TAL SAC |

## Client Sample ID: MEAFF-4DMW03-0317

Date Collected: 03/03/17 10:50

Date Received: 03/04/17 09:15

## Lab Sample ID: 320-26324-2

Matrix: Water

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 03:50       | TC1     | TAL SAC |
| Total/NA  | Prep       | 3535           | DL  |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) | DL  | 10              | 155237       | 03/15/17 20:16       | SBC     | TAL SAC |

## Client Sample ID: MEAFF-4BMW02-0317

Date Collected: 03/03/17 13:05

Date Received: 03/04/17 09:15

## Lab Sample ID: 320-26324-3

Matrix: Water

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 03:58       | TC1     | TAL SAC |

## Client Sample ID: MEAFF-4BMW03-0317

Date Collected: 03/03/17 15:15

Date Received: 03/04/17 09:15

## Lab Sample ID: 320-26324-4

Matrix: Water

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 04:20       | TC1     | TAL SAC |

## Client Sample ID: MEAFF-EB03-GW-0317

Date Collected: 03/03/17 14:00

Date Received: 03/04/17 09:15

## Lab Sample ID: 320-26324-5

Matrix: Water

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3510C          |     |                 | 153806       | 03/08/17 08:41       | SR1     | TAL SAC |
| Total/NA  | Analysis   | WS-MS-0011     |     | 1               | 154875       | 03/15/17 00:04       | A1C     | TAL SAC |
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 04:28       | TC1     | TAL SAC |

# Lab Chronicle

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

**Client Sample ID: MEAFF-EB04-GW-0317**

**Lab Sample ID: 320-26324-6**

**Date Collected: 03/03/17 15:35**

**Matrix: Water**

**Date Received: 03/04/17 09:15**

| Prep Type | Batch Type | Batch Method   | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|----------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Prep       | 3510C          |     |                 | 153806       | 03/08/17 08:41       | SR1     | TAL SAC |
| Total/NA  | Analysis   | WS-MS-0011     |     | 1               | 154875       | 03/15/17 00:27       | A1C     | TAL SAC |
| Total/NA  | Prep       | 3535           |     |                 | 154076       | 03/09/17 10:15       | NS1     | TAL SAC |
| Total/NA  | Analysis   | 537 (Modified) |     | 1               | 154520       | 03/12/17 04:35       | TC1     | TAL SAC |

## Laboratory References:

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

# Certification Summary

Client: CH2M Hill, Inc.  
Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

TestAmerica Job ID: 320-26324-1

## Laboratory: TestAmerica Sacramento

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

| Authority          | Program       | EPA Region | Certification ID | Expiration Date |
|--------------------|---------------|------------|------------------|-----------------|
| Alaska (UST)       | State Program | 10         | UST-055          | 12-18-17        |
| Arizona            | State Program | 9          | AZ0708           | 08-11-17        |
| Arkansas DEQ       | State Program | 6          | 88-0691          | 06-17-17        |
| California         | State Program | 9          | 2897             | 01-31-18        |
| Colorado           | State Program | 8          | CA00044          | 08-31-17        |
| Connecticut        | State Program | 1          | PH-0691          | 06-30-17        |
| Florida            | NELAP         | 4          | E87570           | 06-30-17        |
| Hawaii             | State Program | 9          | N/A              | 01-29-18        |
| Illinois           | NELAP         | 5          | 200060           | 03-17-18        |
| Kansas             | NELAP         | 7          | E-10375          | 10-31-17        |
| L-A-B              | DoD ELAP      |            | L2468            | 01-20-18        |
| Louisiana          | NELAP         | 6          | 30612            | 06-30-17        |
| Maine              | State Program | 1          | CA0004           | 04-18-18        |
| Michigan           | State Program | 5          | 9947             | 01-31-18        |
| Nevada             | State Program | 9          | CA00044          | 07-31-17        |
| New Jersey         | NELAP         | 2          | CA005            | 06-30-17        |
| New York           | NELAP         | 2          | 11666            | 04-01-17 *      |
| Oregon             | NELAP         | 10         | 4040             | 01-28-18        |
| Pennsylvania       | NELAP         | 3          | 68-01272         | 03-31-17 *      |
| Texas              | NELAP         | 6          | T104704399       | 07-31-17        |
| US Fish & Wildlife | Federal       |            | LE148388-0       | 10-31-17        |
| USDA               | Federal       |            | P330-11-00436    | 12-30-17        |
| USEPA UCMR         | Federal       | 1          | CA00044          | 11-06-18        |
| Utah               | NELAP         | 8          | CA00044          | 02-28-18        |
| Virginia           | NELAP         | 3          | 460278           | 03-14-18        |
| Washington         | State Program | 10         | C581             | 05-05-17        |
| West Virginia (DW) | State Program | 3          | 9930C            | 12-31-17        |
| Wyoming            | State Program | 8          | 8TMS-L           | 01-29-17 *      |

\* Certification renewal pending - certification considered valid.

TestAmerica Sacramento

## Method Summary

Client: CH2M Hill, Inc.

TestAmerica Job ID: 320-26324-1

Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

| Method         | Method Description          | Protocol | Laboratory |
|----------------|-----------------------------|----------|------------|
| WS-MS-0011     | 1,4-Dioxane (GC/MS SIM)     | TAL SOP  | TAL SAC    |
| 537 (Modified) | Perfluorinated Hydrocarbons | EPA      | TAL SAC    |

### Protocol References:

EPA = US Environmental Protection Agency

TAL SOP = TestAmerica Laboratories, Standard Operating Procedure

### Laboratory References:

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

## Sample Summary

Client: CH2M Hill, Inc.

TestAmerica Job ID: 320-26324-1

Project/Site: Meridian 10006-7-105420 JM01 Navy Clean

| Lab Sample ID | Client Sample ID   | Matrix | Collected      | Received       |
|---------------|--------------------|--------|----------------|----------------|
| 320-26324-1   | MEAFF-4DMW01-0317  | Water  | 03/03/17 10:00 | 03/04/17 09:15 |
| 320-26324-2   | MEAFF-4DMW03-0317  | Water  | 03/03/17 10:50 | 03/04/17 09:15 |
| 320-26324-3   | MEAFF-4BMW02-0317  | Water  | 03/03/17 13:05 | 03/04/17 09:15 |
| 320-26324-4   | MEAFF-4BMW03-0317  | Water  | 03/03/17 15:15 | 03/04/17 09:15 |
| 320-26324-5   | MEAFF-EB03-GW-0317 | Water  | 03/03/17 14:00 | 03/04/17 09:15 |
| 320-26324-6   | MEAFF-EB04-GW-0317 | Water  | 03/03/17 15:35 | 03/04/17 09:15 |

## GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: SV1 Analysis Batch Number: 151686Lab Sample ID: IC 320-151686/1 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 09:35 Lab File ID: 14D0222A.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME   | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|-----------------|-------------------|--------------------|---------|----------------|
|                 |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane     | 3.36              | Baseline           | onishim | 02/22/17 14:19 |
| Nitrobenzene-d5 | 8.06              | Peak Tail          | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/2 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 09:56 Lab File ID: 14D0222B.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME   | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|-----------------|-------------------|---------------------|---------|----------------|
|                 |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane     | 3.36              | Poor chromatography | onishim | 02/22/17 14:19 |
| Nitrobenzene-d5 | 8.06              | Poor chromatography | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/3 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 10:19 Lab File ID: 14D0222C.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME   | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|-----------------|-------------------|--------------------|---------|----------------|
|                 |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane     | 3.36              | Baseline           | onishim | 02/22/17 14:19 |
| Nitrobenzene-d5 | 8.06              | Peak Tail          | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/4 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 10:41 Lab File ID: 14D0222D.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|---------------|-------------------|---------------------|---------|----------------|
|               |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane   | 3.35              | Poor chromatography | onishim | 02/22/17 14:19 |



## GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: SV1 Analysis Batch Number: 151686Lab Sample ID: ICIS 320-151686/5 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 11:03 Lab File ID: 14D0222E.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|---------------|-------------------|---------------------|---------|----------------|
|               |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane   | 3.35              | Poor chromatography | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/6 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 11:25 Lab File ID: 14D0222F.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|---------------|-------------------|---------------------|---------|----------------|
|               |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane   | 3.36              | Poor chromatography | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/7 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 11:47 Lab File ID: 14D0222G.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|---------------|-------------------|---------------------|---------|----------------|
|               |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane   | 3.36              | Poor chromatography | onishim | 02/22/17 14:19 |

Lab Sample ID: IC 320-151686/8 Client Sample ID: \_\_\_\_\_Date Analyzed: 02/22/17 12:09 Lab File ID: 14D0222H.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION  |         |                |
|---------------|-------------------|---------------------|---------|----------------|
|               |                   | REASON              | ANALYST | DATE           |
| 1,4-Dioxane   | 3.37              | Poor chromatography | onishim | 02/22/17 14:19 |

## GC/MS SEMI VOA MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: SV1 Analysis Batch Number: 154875Lab Sample ID: CCV 320-154875/2 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/14/17 14:42 Lab File ID: 14D0314.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|---------------|-------------------|--------------------|---------|----------------|
|               |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane   | 3.32              | Peak Tail          | onishim | 03/15/17 14:26 |

Lab Sample ID: LCS 320-153806/2-A Client Sample ID: \_\_\_\_\_Date Analyzed: 03/14/17 21:06 Lab File ID: S031417.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|---------------|-------------------|--------------------|---------|----------------|
|               |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane   | 3.32              | Peak Tail          | lardieo | 03/15/17 14:30 |

Lab Sample ID: LCSD 320-153806/3-A Client Sample ID: \_\_\_\_\_Date Analyzed: 03/14/17 21:28 Lab File ID: S031418.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|---------------|-------------------|--------------------|---------|----------------|
|               |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane   | 3.32              | Peak Tail          | onishim | 03/15/17 08:35 |

Lab Sample ID: CCVC 320-154875/29 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/15/17 00:49 Lab File ID: 14D0314A.D GC Column: HP-5MS ID: 0.25 (mm)

| COMPOUND NAME | RETENTION<br>TIME | MANUAL INTEGRATION |         |                |
|---------------|-------------------|--------------------|---------|----------------|
|               |                   | REASON             | ANALYST | DATE           |
| 1,4-Dioxane   | 3.32              | Peak Tail          | onishim | 03/15/17 08:36 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 152681Lab Sample ID: IC 320-152681/2 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/01/17 11:08 Lab File ID: 2017.03.01CURVE\_003.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                        | RETENTION<br>TIME | MANUAL INTEGRATION     |                  |                |
|--------------------------------------|-------------------|------------------------|------------------|----------------|
|                                      |                   | REASON                 | ANALYST          | DATE           |
| Perfluorohexanesulfonic acid (PFHxS) | 2.51              | Isomers                | chandrase<br>nas | 03/01/17 15:43 |
| Perfluorooctanoic acid (PFOA)        | 2.86              | Incomplete Integration | chandrase<br>nas | 03/01/17 15:43 |
| Perfluorooctanesulfonic acid (PFOS)  | 3.23              | Isomers                | chandrase<br>nas | 03/01/17 15:43 |

Lab Sample ID: IC 320-152681/4 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/01/17 11:23 Lab File ID: 2017.03.01CURVE\_005.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |                  |                |
|-------------------------------------|-------------------|--------------------|------------------|----------------|
|                                     |                   | REASON             | ANALYST          | DATE           |
| Perfluorooctanoic acid (PFOA)       | 2.83              | Baseline           | chandrase<br>nas | 03/01/17 15:43 |
| Perfluorooctanesulfonic acid (PFOS) | 3.17              | Baseline           | chandrase<br>nas | 03/01/17 15:43 |

Lab Sample ID: IC 320-152681/5 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/01/17 11:31 Lab File ID: 2017.03.01CURVE\_006.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                        | RETENTION<br>TIME | MANUAL INTEGRATION |                  |                |
|--------------------------------------|-------------------|--------------------|------------------|----------------|
|                                      |                   | REASON             | ANALYST          | DATE           |
| Perfluorohexanesulfonic acid (PFHxS) | 2.49              | Isomers            | chandrase<br>nas | 03/01/17 15:43 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 152681Lab Sample ID: IC 320-152681/6 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/01/17 11:38 Lab File ID: 2017.03.01CURVE\_007.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                           | RETENTION<br>TIME | MANUAL INTEGRATION     |                  |                |
|-----------------------------------------|-------------------|------------------------|------------------|----------------|
|                                         |                   | REASON                 | ANALYST          | DATE           |
| Perfluorohexanesulfonic acid<br>(PFHxS) | 2.48              | Isomers                | chandrase<br>nas | 03/01/17 15:43 |
| 13C2 PFUnA                              | 3.87              | Incomplete Integration | chandrase<br>nas | 03/01/17 15:43 |

Lab Sample ID: IC 320-152681/7 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/01/17 11:46 Lab File ID: 2017.03.01CURVE\_008.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                          | RETENTION<br>TIME | MANUAL INTEGRATION     |                  |                |
|----------------------------------------|-------------------|------------------------|------------------|----------------|
|                                        |                   | REASON                 | ANALYST          | DATE           |
| Perfluorooctanesulfonic acid<br>(PFOS) | 3.19              | Baseline               | chandrase<br>nas | 03/01/17 15:43 |
| M2-8:2FTS                              | 3.52              | Incomplete Integration | chandrase<br>nas | 03/01/17 15:43 |
| 13C2 PFDoA                             | 4.15              | Incomplete Integration | chandrase<br>nas | 03/01/17 15:43 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 154503Lab Sample ID: CCV 320-154503/1 CCVL Client Sample ID: \_\_\_\_\_Date Analyzed: 03/11/17 12:34 Lab File ID: 2017.03.11C\_004.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                           | RETENTION<br>TIME | MANUAL INTEGRATION |           |                |
|-----------------------------------------|-------------------|--------------------|-----------|----------------|
|                                         |                   | REASON             | ANALYST   | DATE           |
| Perfluorobutanoic acid (PFBA)           | 1.56              | Baseline           | changnoit | 03/13/17 11:37 |
| Perfluorohexanesulfonic acid<br>(PFHxS) | 2.52              | Isomers            | changnoit | 03/13/17 11:38 |
| Perfluorooctanesulfonic acid<br>(PFOS)  | 3.25              | Isomers            | changnoit | 03/13/17 11:38 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 154520Lab Sample ID: CCV 320-154520/1 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/12/17 03:20 Lab File ID: 2017.03.11D\_063.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                        | RETENTION TIME | MANUAL INTEGRATION |           |                |
|--------------------------------------|----------------|--------------------|-----------|----------------|
|                                      |                | REASON             | ANALYST   | DATE           |
| Perfluorohexanesulfonic acid (PFHxS) | 2.46           | Isomers            | changnoit | 03/14/17 10:52 |
| 13C4 PFOS                            | 3.19           | Baseline           | changnoit | 03/14/17 10:53 |
| Perfluorooctanesulfonic acid (PFOS)  | 3.19           | Isomers            | changnoit | 03/14/17 10:55 |

Lab Sample ID: MB 320-154076/1-A Client Sample ID: \_\_\_\_\_Date Analyzed: 03/12/17 03:28 Lab File ID: 2017.03.11D\_064.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                 | RETENTION TIME | MANUAL INTEGRATION |           |                |
|-------------------------------|----------------|--------------------|-----------|----------------|
|                               |                | REASON             | ANALYST   | DATE           |
| Perfluorooctanoic acid (PFOA) | 2.83           | Isomers            | changnoit | 03/14/17 10:57 |

Lab Sample ID: LCS 320-154076/2-A Client Sample ID: \_\_\_\_\_Date Analyzed: 03/12/17 03:35 Lab File ID: 2017.03.11D\_065.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION TIME | MANUAL INTEGRATION |           |                |
|-------------------------------------|----------------|--------------------|-----------|----------------|
|                                     |                | REASON             | ANALYST   | DATE           |
| Perfluorooctanesulfonic acid (PFOS) | 3.20           | Isomers            | changnoit | 03/14/17 11:03 |

Lab Sample ID: 320-26324-1 Client Sample ID: MEAFF-4DMW01-0317Date Analyzed: 03/12/17 03:43 Lab File ID: 2017.03.11D\_066.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION TIME | MANUAL INTEGRATION |           |                |
|-------------------------------------|----------------|--------------------|-----------|----------------|
|                                     |                | REASON             | ANALYST   | DATE           |
| Perfluorooctanoic acid (PFOA)       | 2.83           | Isomers            | changnoit | 03/27/17 13:47 |
| Perfluorooctanesulfonic acid (PFOS) | 3.07           | Isomers            | changnoit | 03/27/17 13:47 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 154520Lab Sample ID: 320-26324-2 Client Sample ID: MEAFF-4DMW03-0317Date Analyzed: 03/12/17 03:50 Lab File ID: 2017.03.11D\_067.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |               |                |
|-------------------------------------|-------------------|--------------------|---------------|----------------|
|                                     |                   | REASON             | ANALYST       | DATE           |
| Perfluorobutanesulfonic acid (PFBS) | 1.87              | Baseline           | chandrase nas | 03/27/17 13:48 |
| Perfluorooctanoic acid (PFOA)       | 2.83              | Isomers            | changnoit     | 03/27/17 13:47 |
| Perfluorooctanesulfonic acid (PFOS) | 3.08              | Isomers            | changnoit     | 03/27/17 13:47 |

Lab Sample ID: 320-26324-3 Client Sample ID: MEAFF-4BMW02-0317Date Analyzed: 03/12/17 03:58 Lab File ID: 2017.03.11D\_068.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |           |                |
|-------------------------------------|-------------------|--------------------|-----------|----------------|
|                                     |                   | REASON             | ANALYST   | DATE           |
| Perfluorooctanoic acid (PFOA)       | 2.81              | Isomers            | changnoit | 03/14/17 11:11 |
| Perfluorooctanesulfonic acid (PFOS) | 3.19              | Isomers            | changnoit | 03/14/17 11:10 |

Lab Sample ID: 320-26324-3 MS Client Sample ID: MEAFF-4BMW02-0317-MS MSDate Analyzed: 03/12/17 04:05 Lab File ID: 2017.03.11D\_069.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |           |                |
|-------------------------------------|-------------------|--------------------|-----------|----------------|
|                                     |                   | REASON             | ANALYST   | DATE           |
| Perfluorooctanesulfonic acid (PFOS) | 3.19              | Isomers            | changnoit | 03/14/17 11:15 |

Lab Sample ID: 320-26324-3 MSD Client Sample ID: MEAFF-4BMW02-0317-SD MSDDate Analyzed: 03/12/17 04:13 Lab File ID: 2017.03.11D\_070.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |           |                |
|-------------------------------------|-------------------|--------------------|-----------|----------------|
|                                     |                   | REASON             | ANALYST   | DATE           |
| Perfluorooctanesulfonic acid (PFOS) | 3.20              | Isomers            | changnoit | 03/14/17 11:19 |

## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 154520Lab Sample ID: CCV 320-154520/12 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/12/17 04:43 Lab File ID: 2017.03.11D\_074.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                           | RETENTION<br>TIME | MANUAL INTEGRATION |           |                |
|-----------------------------------------|-------------------|--------------------|-----------|----------------|
|                                         |                   | REASON             | ANALYST   | DATE           |
| Perfluorohexanesulfonic acid<br>(PFHxS) | 2.47              | Isomers            | changnoit | 03/14/17 11:22 |
| Perfluorooctanesulfonic acid<br>(PFOS)  | 3.19              | Isomers            | changnoit | 03/14/17 11:22 |



## LCMS MANUAL INTEGRATION SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Analysis Batch Number: 155237Lab Sample ID: CCV 320-155237/1 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/15/17 20:08 Lab File ID: 2017.03.15D\_024.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |                  |                |
|-------------------------------------|-------------------|--------------------|------------------|----------------|
|                                     |                   | REASON             | ANALYST          | DATE           |
| Perfluorooctanesulfonic acid (PFOS) | 3.16              | Isomers            | chandrase<br>nas | 03/16/17 11:48 |

Lab Sample ID: 320-26324-2 DL Client Sample ID: MEAFF-4DMW03-0317 DLDate Analyzed: 03/15/17 20:16 Lab File ID: 2017.03.15D\_025.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                       | RETENTION<br>TIME | MANUAL INTEGRATION |                  |                |
|-------------------------------------|-------------------|--------------------|------------------|----------------|
|                                     |                   | REASON             | ANALYST          | DATE           |
| Perfluorobutanesulfonic acid (PFBS) | 1.83              | Baseline           | chandrase<br>nas | 03/27/17 13:57 |
| Perfluorooctanoic acid (PFOA)       | 2.78              | Isomers            | chandrase<br>nas | 03/27/17 13:57 |

Lab Sample ID: CCV 320-155237/9 Client Sample ID: \_\_\_\_\_Date Analyzed: 03/15/17 21:08 Lab File ID: 2017.03.15D\_032.d GC Column: GeminiC18 3x1 ID: 3 (mm)

| COMPOUND NAME                        | RETENTION<br>TIME | MANUAL INTEGRATION     |                  |                |
|--------------------------------------|-------------------|------------------------|------------------|----------------|
|                                      |                   | REASON                 | ANALYST          | DATE           |
| 13C4-PFHpA                           | 2.43              | Incomplete Integration | chandrase<br>nas | 03/16/17 11:49 |
| Perfluorohexanesulfonic acid (PFHxS) | 2.45              | Isomers                | chandrase<br>nas | 03/16/17 11:49 |
| Perfluorooctanesulfonic acid (PFOS)  | 3.16              | Isomers                | chandrase<br>nas | 03/16/17 11:49 |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID         | Exp Date | Prep Date                                 | Dilutant Used              | Reagent Final Volume | Parent Reagent      |              | Analyte                                   | Concentration  |
|--------------------|----------|-------------------------------------------|----------------------------|----------------------|---------------------|--------------|-------------------------------------------|----------------|
|                    |          |                                           |                            |                      | Reagent ID          | Volume Added |                                           |                |
| LCMPFCSU_00053     | 09/03/17 | 03/06/17                                  | Methanol, Lot Baker 141039 | 35750 uL             | LCMPFBS_00001       | 750 uL       | 13C3-PFBS                                 | 0.975524 ug/mL |
|                    |          |                                           |                            |                      | LCMPFCSU_00052      | 35000 uL     | 13C2-PFHxDA                               | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C2-PFTeDA                               | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C4-PFHpA                                | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C5-PFPeA                                | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C8 FOSA                                 | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C4 PFBA                                 | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C2 PFDA                                 | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C2 PFDoA                                | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C2 PFHxA                                | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 1802 PFHxS                                | 0.926154 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C5 PFNA                                 | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C4 PFOA                                 | 0.979021 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C4 PFOS                                 | 0.935944 ug/mL |
|                    |          |                                           |                            |                      |                     |              | 13C2 PFUnA                                | 0.979021 ug/mL |
| .LCMPFBS_00001     | 08/20/20 | Wellington Laboratories, Lot M3PFBS0815   |                            |                      | (Purchased Reagent) |              | 13C3-PFBS                                 | 46.5 ug/mL     |
| .LCMPFCSU_00052    | 09/03/17 | 03/03/17                                  | Methanol, Lot Baker 141039 | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                               | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                               | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCM4PFHPA_00007     | 1000 uL      | 13C4-PFHpA                                | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                                | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCM8FOSA_00011      | 1000 uL      | 13C8 FOSA                                 | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFBA_00008       | 1000 uL      | 13C4 PFBA                                 | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFDA_00011       | 1000 uL      | 13C2 PFDA                                 | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDoA                                | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                                | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFHxS_00008      | 1000 uL      | 1802 PFHxS                                | 0.946 ug/mL    |
|                    |          |                                           |                            |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                                 | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                                 | 1 ug/mL        |
|                    |          |                                           |                            |                      | LCMPFOS_00018       | 1000 uL      | 13C4 PFOS                                 | 0.956 ug/mL    |
|                    |          |                                           |                            |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                                | 1 ug/mL        |
|                    |          |                                           |                            |                      | ..LCM2PFHxDA_00008  | 01/07/21     | Wellington Laboratories, Lot M2PFHxDA1112 |                |
| ..LCM2PFTeDA_00007 | 12/07/20 | Wellington Laboratories, Lot M2PFTeDA1115 |                            |                      | (Purchased Reagent) |              | 13C2-PFTeDA                               | 50 ug/mL       |
| ..LCM4PFHPA_00007  | 05/27/21 | Wellington Laboratories, Lot M4PFHpA0516  |                            |                      | (Purchased Reagent) |              | 13C4-PFHpA                                | 50 ug/mL       |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID          | Exp Date | Prep Date                                | Dilutant Used       | Reagent Final Volume | Parent Reagent      |              | Analyte                                         | Concentration |
|---------------------|----------|------------------------------------------|---------------------|----------------------|---------------------|--------------|-------------------------------------------------|---------------|
|                     |          |                                          |                     |                      | Reagent ID          | Volume Added |                                                 |               |
| ..LCM5PFPEA 00008   | 05/22/20 | Wellington Laboratories, Lot M5PFPeA0515 |                     |                      | (Purchased Reagent) |              | 13C5-PFPeA                                      | 50 ug/mL      |
| ..LCM8FOSA 00011    | 12/22/17 | Wellington Laboratories, Lot M8FOSA1215I |                     |                      | (Purchased Reagent) |              | 13C8 FOSA                                       | 50 ug/mL      |
| ..LCMPFBA 00008     | 05/24/21 | Wellington Laboratories, Lot MPFBA0516   |                     |                      | (Purchased Reagent) |              | 13C4 PFBA                                       | 50 ug/mL      |
| ..LCMPFDA 00011     | 08/19/20 | Wellington Laboratories, Lot MPFDA0815   |                     |                      | (Purchased Reagent) |              | 13C2 PFDA                                       | 50 ug/mL      |
| ..LCMPFDoA 00008    | 04/08/21 | Wellington Laboratories, Lot MPFDoA0416  |                     |                      | (Purchased Reagent) |              | 13C2 PFDoA                                      | 50 ug/mL      |
| ..LCMPFHxA 00012    | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416  |                     |                      | (Purchased Reagent) |              | 13C2 PFHxA                                      | 50 ug/mL      |
| ..LCMPFHxS 00008    | 10/23/20 | Wellington Laboratories, Lot MPFHxS1015  |                     |                      | (Purchased Reagent) |              | 18O2 PFHxS                                      | 47.3 ug/mL    |
| ..LCMPFNA 00008     | 04/13/19 | Wellington Laboratories, Lot MPFNA0414   |                     |                      | (Purchased Reagent) |              | 13C5 PFNA                                       | 50 ug/mL      |
| ..LCMPFOA 00012     | 01/22/21 | Wellington Laboratories, Lot MPFOA0116   |                     |                      | (Purchased Reagent) |              | 13C4 PFOA                                       | 50 ug/mL      |
| ..LCMPFOS 00018     | 08/03/21 | Wellington Laboratories, Lot MPFOS0816   |                     |                      | (Purchased Reagent) |              | 13C4 PFOS                                       | 47.8 ug/mL    |
| ..LCMPFUDa 00009    | 02/12/21 | Wellington Laboratories, Lot MPFUDa0216  |                     |                      | (Purchased Reagent) |              | 13C2 PFUnA                                      | 50 ug/mL      |
| LCPFC_FULL-L1_00001 | 06/14/17 | 02/16/17                                 | MeOH/H2O, Lot 90285 | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                                    | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | d-N-MeFOSA-M                                    | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | d3-NMeFOSAA                                     | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | d5-NEtFOSAA                                     | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | M2-6:2FTS                                       | 47.5 ng/mL    |
|                     |          |                                          |                     |                      |                     |              | M2-8:2FTS                                       | 47.9 ng/mL    |
|                     |          |                                          |                     |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                                     | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C2-PFTeDA                                     | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C4-PFHpA                                      | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C5-PFPeA                                      | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C8 FOSA                                       | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C4 PFBA                                       | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C2 PFDA                                       | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C2 PFDoA                                      | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C2 PFHxA                                      | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 18O2 PFHxS                                      | 47.3 ng/mL    |
|                     |          |                                          |                     |                      |                     |              | 13C5 PFNA                                       | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C4 PFOA                                       | 50 ng/mL      |
|                     |          |                                          |                     |                      |                     |              | 13C4 PFOS                                       | 47.8 ng/mL    |
|                     |          |                                          |                     |                      |                     |              | 13C2 PFUnA                                      | 50 ng/mL      |
|                     |          |                                          |                     |                      | LCPFC2SP_00025      | 25 uL        | Sodium                                          | 0.474 ng/mL   |
|                     |          |                                          |                     |                      |                     |              | 1H,1H,2H,2H-perfluorooctane sulfonate (6:2)     |               |
|                     |          |                                          |                     |                      |                     |              | Sodium                                          | 0.479 ng/mL   |
|                     |          |                                          |                     |                      |                     |              | 1H,1H,2H,2H-perfluorooctane sulfonate (8:2)     |               |
|                     |          |                                          |                     |                      |                     |              | N-ethylperfluoro-1-octanesulfo namide           | 0.5 ng/mL     |
|                     |          |                                          |                     |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid  | 0.5 ng/mL     |
|                     |          |                                          |                     |                      | LCPFCSP_00078       | 25 uL        | MeFOSA                                          | 0.5 ng/mL     |
|                     |          |                                          |                     |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid | 0.5 ng/mL     |
|                     |          |                                          |                     |                      |                     |              | Perfluorobutyric acid                           | 0.5 ng/mL     |
|                     |          |                                          |                     |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)             | 0.442 ng/mL   |
|                     |          |                                          |                     |                      |                     |              | Perfluorodecanoic acid                          | 0.5 ng/mL     |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID               | Exp Date  | Prep Date                                 | Dilutant Used              | Reagent Final Volume | Parent Reagent      |              | Analyte                                   | Concentration |
|--------------------------|-----------|-------------------------------------------|----------------------------|----------------------|---------------------|--------------|-------------------------------------------|---------------|
|                          |           |                                           |                            |                      | Reagent ID          | Volume Added |                                           |               |
|                          |           |                                           |                            |                      |                     |              | Perfluorododecanoic acid                  | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorodecane Sulfonic acid             | 0.482 ng/mL   |
|                          |           |                                           |                            |                      |                     |              | Perfluoroheptanoic acid                   | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluoroheptanesulfonic Acid             | 0.476 ng/mL   |
|                          |           |                                           |                            |                      |                     |              | Perfluorohexanoic acid                    | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorohexadecanoic acid                | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorohexanesulfonic acid              | 0.455 ng/mL   |
|                          |           |                                           |                            |                      |                     |              | Perfluorononanoic acid                    | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorooctanoic acid (PFOA)             | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorooctadecanoic acid                | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)       | 0.464 ng/mL   |
|                          |           |                                           |                            |                      |                     |              | Perfluorooctane Sulfonamide               | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluoropentanoic acid                   | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorotetradecanoic acid               | 0.5 ng/mL     |
|                          |           |                                           |                            |                      |                     |              | Perfluorotridecanoic acid                 | 0.5 ng/mL     |
| Perfluoroundecanoic acid | 0.5 ng/mL |                                           |                            |                      |                     |              |                                           |               |
| .LCMPFC2SU_00014         | 08/13/17  | 02/13/17                                  | Methanol, Lot 104453       | 50000 uL             | LCd-NEtFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                              | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                              | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                               | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCd5-NEtFOSAA 00003 | 1000 uL      | d5-NEtFOSAA                               | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                                 | 0.95 ug/mL    |
|                          |           |                                           |                            |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                                 | 0.958 ug/mL   |
| ..LCd-NEtFOSA-M 00004    | 06/10/21  | WELLINGTON, Lot dNetFOSA0616M             |                            |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                              | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003    | 06/10/21  | WELLINGTON, Lot dNMeFOSA0616M             |                            |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                              | 50 ug/mL      |
| ..LCd3-NMeFOSAA 00003    | 05/31/21  | WELLINGTON, Lot d3NMeFOSAA0516            |                            |                      | (Purchased Reagent) |              | d3-NMeFOSAA                               | 50 ug/mL      |
| ..LCd5-NEtFOSAA 00003    | 08/02/21  | WELLINGTON, Lot d5NetFOSAA0716            |                            |                      | (Purchased Reagent) |              | d5-NEtFOSAA                               | 50 ug/mL      |
| ..LCM2-6:FTS 00003       | 01/08/21  | WELLINGTON, Lot M262FTS0116               |                            |                      | (Purchased Reagent) |              | M2-6:2FTS                                 | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003      | 01/08/21  | WELLINGTON, Lot M282FTS0116               |                            |                      | (Purchased Reagent) |              | M2-8:2FTS                                 | 47.9 ug/mL    |
| .LCMPFCSU_00047          | 06/14/17  | 12/14/16                                  | Methanol, Lot Baker 144541 | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                               | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCM2PFTeDA 00007    | 1000 uL      | 13C2-PFTeDA                               | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCM4PFHPA 00007     | 1000 uL      | 13C4-PFHpA                                | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCM5PFPEA 00008     | 1000 uL      | 13C5-PFPeA                                | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCM8FOSA 00011      | 1000 uL      | 13C8 FOSA                                 | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFBA 00008       | 1000 uL      | 13C4 PFBA                                 | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFDA 00011       | 1000 uL      | 13C2 PFDA                                 | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFDoA 00008      | 1000 uL      | 13C2 PFDoA                                | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFHxA 00012      | 1000 uL      | 13C2 PFHxA                                | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFHxS 00008      | 1000 uL      | 1802 PFHxS                                | 0.946 ug/mL   |
|                          |           |                                           |                            |                      | LCMPFNA 00008       | 1000 uL      | 13C5 PFNA                                 | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFOA 00012       | 1000 uL      | 13C4 PFOA                                 | 1 ug/mL       |
|                          |           |                                           |                            |                      | LCMPFOS 00017       | 1000 uL      | 13C4 PFOS                                 | 0.956 ug/mL   |
|                          |           |                                           |                            |                      | LCMPFUdA 00009      | 1000 uL      | 13C2 PFUnA                                | 1 ug/mL       |
|                          |           |                                           |                            |                      | ..LCM2PFHxDA 00008  | 01/07/21     | Wellington Laboratories, Lot M2PFHxDA1112 |               |
| ..LCM2PFTeDA 00007       | 12/07/20  | Wellington Laboratories, Lot M2PFTeDA1115 |                            |                      | (Purchased Reagent) |              | 13C2-PFTeDA                               | 50 ug/mL      |
| ..LCM4PFHPA 00007        | 05/27/21  | Wellington Laboratories, Lot M4PFHpA0516  |                            |                      | (Purchased Reagent) |              | 13C4-PFHpA                                | 50 ug/mL      |
| ..LCM5PFPEA 00008        | 05/22/20  | Wellington Laboratories, Lot M5PFPeA0515  |                            |                      | (Purchased Reagent) |              | 13C5-PFPeA                                | 50 ug/mL      |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

SDG No.:

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                            | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|------------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                                          |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LCM8FOSA_00011      | 12/22/17 |           | Wellington Laboratories, Lot M8FOSA1215I |                      | (Purchased Reagent) |              | 13C8 FOSA                                          | 50 ug/mL      |
| ..LCMPFBA_00008       | 05/24/21 |           | Wellington Laboratories, Lot MPFBA0516   |                      | (Purchased Reagent) |              | 13C4 PFBA                                          | 50 ug/mL      |
| ..LCMPFDA_00011       | 08/19/20 |           | Wellington Laboratories, Lot MPFDA0815   |                      | (Purchased Reagent) |              | 13C2 PFDA                                          | 50 ug/mL      |
| ..LCMPFDoA_00008      | 04/08/21 |           | Wellington Laboratories, Lot MPFDoA0416  |                      | (Purchased Reagent) |              | 13C2 PFDoA                                         | 50 ug/mL      |
| ..LCMPFHxA_00012      | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416  |                      | (Purchased Reagent) |              | 13C2 PFHxA                                         | 50 ug/mL      |
| ..LCMPFHxS_00008      | 10/23/20 |           | Wellington Laboratories, Lot MPFHxS1015  |                      | (Purchased Reagent) |              | 18O2 PFHxS                                         | 47.3 ug/mL    |
| ..LCMPFNA_00008       | 04/13/19 |           | Wellington Laboratories, Lot MPFNA0414   |                      | (Purchased Reagent) |              | 13C5 PFNA                                          | 50 ug/mL      |
| ..LCMPFOA_00012       | 01/22/21 |           | Wellington Laboratories, Lot MPFOA0116   |                      | (Purchased Reagent) |              | 13C4 PFOA                                          | 50 ug/mL      |
| ..LCMPFOS_00017       | 08/03/21 |           | Wellington Laboratories, Lot MPFOS0816   |                      | (Purchased Reagent) |              | 13C4 PFOS                                          | 47.8 ug/mL    |
| ..LCMPFUDa_00009      | 02/12/21 |           | Wellington Laboratories, Lot MPFUDa0216  |                      | (Purchased Reagent) |              | 13C2 PFUnA                                         | 50 ug/mL      |
| .LCPFC2SP_00025       | 06/28/17 | 01/30/17  | Methanol, Lot 104453                     | 10000 uL             | LCPFC2SP_00020      | 2000 uL      | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.0948 ug/mL  |
|                       |          |           |                                          |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.0958 ug/mL  |
|                       |          |           |                                          |                      |                     |              | N-ethylperfluoro-1-octanesulfo namide              | 0.1 ug/mL     |
|                       |          |           |                                          |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 0.1 ug/mL     |
|                       |          |           |                                          |                      |                     |              | MeFOSA                                             | 0.1 ug/mL     |
|                       |          |           |                                          |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 0.1 ug/mL     |
| ..LCPFC2SP_00020      | 06/28/17 | 12/28/16  | Methanol, Lot 104453                     | 10000 uL             | LC6:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.474 ug/mL   |
|                       |          |           |                                          |                      | LC8:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.479 ug/mL   |
|                       |          |           |                                          |                      | LCN-EtFOSA-M_00003  | 100 uL       | N-ethylperfluoro-1-octanesulfo namide              | 0.5 ug/mL     |
|                       |          |           |                                          |                      | LCN-EtFOSAA_00002   | 100 uL       | N-ethyl perfluorooctane sulfonamidoacetic acid     | 0.5 ug/mL     |
|                       |          |           |                                          |                      | LCN-MeFOSA-M_00002  | 100 uL       | MeFOSA                                             | 0.5 ug/mL     |
|                       |          |           |                                          |                      | LCN-MeFOSAA_00003   | 100 uL       | N-methyl perfluorooctane sulfonamidoacetic acid    | 0.5 ug/mL     |
| ...LC6:2FTS_00002     | 06/25/21 |           | WELLINGTON, Lot 62FTS0616                |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ug/mL    |
| ...LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015                |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ug/mL    |
| ...LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NETFOSA0516M             |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfo namide              | 50 ug/mL      |
| ...LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NETFOSAA0116             |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 50 ug/mL      |
| ...LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M             |                      | (Purchased Reagent) |              | MeFOSA                                             | 50 ug/mL      |
| ...LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116             |                      | (Purchased Reagent) |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 50 ug/mL      |
| .LCPFCSP_00078        | 06/14/17 | 01/16/17  | Methanol, Lot 090285                     | 10000 uL             | LCPFCSP_00075       | 2000 uL      | Perfluorobutyric acid                              | 0.1 ug/mL     |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID       | Exp Date | Prep Date | Dilutant Used        | Reagent Final Volume | Parent Reagent |              | Analyte                             | Concentration |
|------------------|----------|-----------|----------------------|----------------------|----------------|--------------|-------------------------------------|---------------|
|                  |          |           |                      |                      | Reagent ID     | Volume Added |                                     |               |
|                  |          |           |                      |                      |                |              | Perfluorobutanesulfonic acid (PFBS) | 0.0884 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorodecanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorododecanoic acid            | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorodecane Sulfonic acid       | 0.0964 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluoroheptanoic acid             | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroheptanesulfonic Acid       | 0.0952 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorohexanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexadecanoic acid          | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexanesulfonic acid        | 0.091 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorononanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanoic acid (PFOA)       | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctadecanoic acid          | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanesulfonic acid (PFOS) | 0.0928 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorooctane Sulfonamide         | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoropentanoic acid             | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotetradecanoic acid         | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotridecanoic acid           | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroundecanoic acid            | 0.1 ug/mL     |
| ..LCPFCSP_00075  | 06/14/17 | 12/14/16  | Methanol, Lot 090285 | 10000 uL             | LCPFCSP_00074  | 5000 uL      | Perfluorobutyric acid               | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorobutanesulfonic acid (PFBS) | 0.442 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorodecanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorododecanoic acid            | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorodecane Sulfonic acid       | 0.482 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluoroheptanoic acid             | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroheptanesulfonic Acid       | 0.476 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorohexanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexadecanoic acid          | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexanesulfonic acid        | 0.455 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorononanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanoic acid (PFOA)       | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctadecanoic acid          | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanesulfonic acid (PFOS) | 0.464 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorooctane Sulfonamide         | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoropentanoic acid             | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotetradecanoic acid         | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotridecanoic acid           | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroundecanoic acid            | 0.5 ug/mL     |
| ...LCPFCSP_00074 | 06/14/17 | 12/14/16  | Methanol, Lot 090285 | 10000 uL             | LCPFBA_00005   | 200 uL       | Perfluorobutyric acid               | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFBS_00005   | 200 uL       | Perfluorobutanesulfonic acid (PFBS) | 0.884 ug/mL   |
|                  |          |           |                      |                      | LCPFDA_00005   | 200 uL       | Perfluorodecanoic acid              | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFDoA_00005  | 200 uL       | Perfluorododecanoic acid            | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFDS_00006   | 200 uL       | Perfluorodecane Sulfonic acid       | 0.964 ug/mL   |
|                  |          |           |                      |                      | LCPFHpA_00006  | 200 uL       | Perfluoroheptanoic acid             | 1 ug/mL       |

## REAGENT TRACEABILITY SUMMARY

 Lab Name: TestAmerica Sacramento

 Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                      |          |           |                                           |                      | Reagent ID          | Volume Added |                                     |               |
|                      |          |           |                                           |                      | LCPFHpS_00009       | 200 uL       | Perfluoroheptanesulfonic Acid       | 0.952 ug/mL   |
|                      |          |           |                                           |                      | LCPFHxA_00005       | 200 uL       | Perfluorohexanoic acid              | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFHxDA_00006      | 200 uL       | Perfluorohexadecanoic acid          | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFHxS-br_00002    | 200 uL       | Perfluorohexanesulfonic acid        | 0.91 ug/mL    |
|                      |          |           |                                           |                      | LCPFNA_00006        | 200 uL       | Perfluorononanoic acid              | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFOA_00006        | 200 uL       | Perfluorooctanoic acid (PFOA)       | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFODA_00006       | 200 uL       | Perfluorooctadecanoic acid          | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFOS-br_00002     | 200 uL       | Perfluorooctanesulfonic acid (PFOS) | 0.928 ug/mL   |
|                      |          |           |                                           |                      | LCPFOSA_00008       | 200 uL       | Perfluorooctane Sulfonamide         | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFPeA_00005       | 200 uL       | Perfluoropentanoic acid             | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFTeDA_00005      | 200 uL       | Perfluorotetradecanoic acid         | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFTrDA_00005      | 200 uL       | Perfluorotridecanoic acid           | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFUDa_00005       | 200 uL       | Perfluoroundecanoic acid            | 1 ug/mL       |
| ....LCPFBA_00005     | 05/27/21 |           | Wellington Laboratories, Lot PFBA0516     |                      | (Purchased Reagent) |              | Perfluorobutyric acid               | 50 ug/mL      |
| ....LCPFBS_00005     | 03/15/21 |           | Wellington Laboratories, Lot LPFBS0316    |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS) | 44.2 ug/mL    |
| ....LCPFDA_00005     | 07/02/20 |           | Wellington Laboratories, Lot PFDA0615     |                      | (Purchased Reagent) |              | Perfluorodecanoic acid              | 50 ug/mL      |
| ....LCPFDaA_00005    | 01/30/20 |           | Wellington Laboratories, Lot PFDaA0115    |                      | (Purchased Reagent) |              | Perfluorododecanoic acid            | 50 ug/mL      |
| ....LCPFDS_00006     | 05/24/21 |           | Wellington Laboratories, Lot LPFDS0516    |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonic acid       | 48.2 ug/mL    |
| ....LCPFHpA_00006    | 01/22/21 |           | Wellington Laboratories, Lot PFHpA0116    |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid             | 50 ug/mL      |
| ....LCPFHpS_00009    | 11/06/20 |           | Wellington Laboratories, Lot LPFHpS1115   |                      | (Purchased Reagent) |              | Perfluoroheptanesulfonic Acid       | 47.6 ug/mL    |
| ....LCPFHxA_00005    | 12/22/20 |           | Wellington Laboratories, Lot PFHxA1215    |                      | (Purchased Reagent) |              | Perfluorohexanoic acid              | 50 ug/mL      |
| ....LCPFHxDA_00006   | 05/25/21 |           | Wellington Laboratories, Lot PFHxDA0516   |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid          | 50 ug/mL      |
| ....LCPFHxS-br_00002 | 07/03/20 |           | Wellington Laboratories, Lot brPFHxSK0615 |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid        | 45.5 ug/mL    |
| ....LCPFNA_00006     | 10/23/20 |           | Wellington Laboratories, Lot PFNA1015     |                      | (Purchased Reagent) |              | Perfluorononanoic acid              | 50 ug/mL      |
| ....LCPFOA_00006     | 11/06/20 |           | Wellington Laboratories, Lot PFOA1115     |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)       | 50 ug/mL      |
| ....LCPFODA_00006    | 04/29/21 |           | Wellington Laboratories, Lot PFODA0416    |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid          | 50 ug/mL      |
| ....LCPFOS-br_00002  | 10/14/20 |           | Wellington Laboratories, Lot brPFOSK1015  |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 46.4 ug/mL    |
| ....LCPFOSA_00008    | 09/02/17 |           | Wellington Laboratories, Lot FOSA0815I    |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide         | 50 ug/mL      |
| ....LCPFPeA_00005    | 01/30/20 |           | Wellington Laboratories, Lot PFPeA0115    |                      | (Purchased Reagent) |              | Perfluoropentanoic acid             | 50 ug/mL      |
| ....LCPFTeDA_00005   | 12/09/20 |           | Wellington Laboratories, Lot PFTeDA1215   |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid         | 50 ug/mL      |
| ....LCPFTrDA_00005   | 02/12/21 |           | Wellington Laboratories, Lot PFTrDA0216   |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid           | 50 ug/mL      |
| ....LCPFUDa_00005    | 08/19/20 |           | Wellington Laboratories, Lot PFUDa0815    |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid            | 50 ug/mL      |
| LCPFC_FULL-L2_00001  | 06/14/17 | 02/16/17  | MeOH/H2O, Lot 090285                      | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                        | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | d-N-MeFOSA-M                        | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | d3-NMeFOSAA                         | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | d5-NETFOSAA                         | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | M2-6:2FTS                           | 47.5 ng/mL    |
|                      |          |           |                                           |                      |                     |              | M2-8:2FTS                           | 47.9 ng/mL    |
|                      |          |           |                                           |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                         | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C2-PFTeDA                         | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C4-PFHpA                          | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C5-PFPeA                          | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C8 FOSA                           | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C4 PFBA                           | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              | 13C2 PFDA                           | 50 ng/mL      |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |
|                      |          |           |                                           |                      |                     |              |                                     |               |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                 | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|-------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                               |                      | Reagent ID          | Volume Added |                                                    |               |
|                       |          |           |                               |                      |                     |              | 13C2 PFDoA                                         | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C2 PFHxA                                         | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 18O2 PFHxS                                         | 47.3 ng/mL    |
|                       |          |           |                               |                      |                     |              | 13C5 PFNA                                          | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C4 PFOA                                          | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C4 PFOS                                          | 47.8 ng/mL    |
|                       |          |           |                               |                      |                     |              | 13C2 PFUnA                                         | 50 ng/mL      |
|                       |          |           |                               |                      | LCPFC2SP_00025      | 50 uL        | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.948 ng/mL   |
|                       |          |           |                               |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.958 ng/mL   |
|                       |          |           |                               |                      |                     |              | N-ethylperfluoro-1-octanesulfonamide               | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | MeFOSA                                             | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              |                                                    |               |
|                       |          |           |                               |                      | LCPFCSP_00078       | 50 uL        | Perfluorobutyric acid                              | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)                | 0.884 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorodecanoic acid                             | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorododecanoic acid                           | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorodecane Sulfonic acid                      | 0.964 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluoroheptanoic acid                            | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluoroheptanesulfonic Acid                      | 0.952 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorohexanoic acid                             | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorohexadecanoic acid                         | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorohexanesulfonic acid                       | 0.91 ng/mL    |
|                       |          |           |                               |                      |                     |              | Perfluorononanoic acid                             | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorooctanoic acid (PFOA)                      | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorooctadecanoic acid                         | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)                | 0.928 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorooctane Sulfonamide                        | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluoropentanoic acid                            | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorotetradecanoic acid                        | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluorotridecanoic acid                          | 1 ng/mL       |
|                       |          |           |                               |                      |                     |              | Perfluoroundecanoic acid                           | 1 ng/mL       |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17  | Methanol, Lot 104453          | 50000 uL             | LCd-NEtFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                               |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                               |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                                        | 1 ug/mL       |
|                       |          |           |                               |                      | LCd5-NEtFOSAA 00003 | 1000 uL      | d5-NEtFOSAA                                        | 1 ug/mL       |
|                       |          |           |                               |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                                          | 0.95 ug/mL    |
|                       |          |           |                               |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                                          | 0.958 ug/mL   |
| ..LCd-NEtFOSA-M 00004 | 06/10/21 |           | WELLINGTON, Lot dNetFOSA0616M |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                                       | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 |           | WELLINGTON, Lot dNMeFOSA0616M |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                                       | 50 ug/mL      |



## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

SDG No.:

| Reagent ID            | Exp Date | Prep Date                                 | Dilutant Used                  | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-------------------------------------------|--------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |                                           |                                |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 |                                           | WELLINGTON, Lot d3NMeFOSAA0516 |                      | (Purchased Reagent) |              | d3-NMeFOSAA                                        | 50 ug/mL      |
| ..LCd5-NEtFOSAA 00003 | 08/02/21 |                                           | WELLINGTON, Lot d5NEtFOSAA0716 |                      | (Purchased Reagent) |              | d5-NEtFOSAA                                        | 50 ug/mL      |
| ..LCM2-6:FTS 00003    | 01/08/21 |                                           | WELLINGTON, Lot M262FTS0116    |                      | (Purchased Reagent) |              | M2-6:2FTS                                          | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003   | 01/08/21 |                                           | WELLINGTON, Lot M282FTS0116    |                      | (Purchased Reagent) |              | M2-8:2FTS                                          | 47.9 ug/mL    |
| ..LCMPFCSU_00047      | 06/14/17 | 12/14/16                                  | Methanol, Lot Baker 144541     | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                                        | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                                        | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCM4PFHFA_00007     | 1000 uL      | 13C4-PFHFA                                         | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                                         | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCM8FOSA_00011      | 1000 uL      | 13C8 FOSA                                          | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFBA_00008       | 1000 uL      | 13C4 PFBA                                          | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFDA_00011       | 1000 uL      | 13C2 PFDA                                          | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDoA                                         | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                                         | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFHxS_00008      | 1000 uL      | 18O2 PFHxS                                         | 0.946 ug/mL   |
|                       |          |                                           |                                |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                                          | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                                          | 1 ug/mL       |
|                       |          |                                           |                                |                      | LCMPFOS_00017       | 1000 uL      | 13C4 PFOS                                          | 0.956 ug/mL   |
|                       |          |                                           |                                |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                                         | 1 ug/mL       |
| ..LCM2PFHxDA 00008    | 01/07/21 | Wellington Laboratories, Lot M2PFHxDA1112 |                                |                      | (Purchased Reagent) |              | 13C2-PFHxDA                                        | 50 ug/mL      |
| ..LCM2PFTeDA 00007    | 12/07/20 | Wellington Laboratories, Lot M2PFTeDA1115 |                                |                      | (Purchased Reagent) |              | 13C2-PFTeDA                                        | 50 ug/mL      |
| ..LCM4PFHFA 00007     | 05/27/21 | Wellington Laboratories, Lot M4PFHFA0516  |                                |                      | (Purchased Reagent) |              | 13C4-PFHFA                                         | 50 ug/mL      |
| ..LCM5PFPEA 00008     | 05/22/20 | Wellington Laboratories, Lot M5PFPeA0515  |                                |                      | (Purchased Reagent) |              | 13C5-PFPeA                                         | 50 ug/mL      |
| ..LCM8FOSA 00011      | 12/22/17 | Wellington Laboratories, Lot M8FOSA1215I  |                                |                      | (Purchased Reagent) |              | 13C8 FOSA                                          | 50 ug/mL      |
| ..LCMPFBA 00008       | 05/24/21 | Wellington Laboratories, Lot MPFBA0516    |                                |                      | (Purchased Reagent) |              | 13C4 PFBA                                          | 50 ug/mL      |
| ..LCMPFDA 00011       | 08/19/20 | Wellington Laboratories, Lot MPFDA0815    |                                |                      | (Purchased Reagent) |              | 13C2 PFDA                                          | 50 ug/mL      |
| ..LCMPFDoA 00008      | 04/08/21 | Wellington Laboratories, Lot MPFDoA0416   |                                |                      | (Purchased Reagent) |              | 13C2 PFDoA                                         | 50 ug/mL      |
| ..LCMPFHxA 00012      | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416   |                                |                      | (Purchased Reagent) |              | 13C2 PFHxA                                         | 50 ug/mL      |
| ..LCMPFHxS 00008      | 10/23/20 | Wellington Laboratories, Lot MPFHxS1015   |                                |                      | (Purchased Reagent) |              | 18O2 PFHxS                                         | 47.3 ug/mL    |
| ..LCMPFNA 00008       | 04/13/19 | Wellington Laboratories, Lot MPFNA0414    |                                |                      | (Purchased Reagent) |              | 13C5 PFNA                                          | 50 ug/mL      |
| ..LCMPFOA 00012       | 01/22/21 | Wellington Laboratories, Lot MPFOA0116    |                                |                      | (Purchased Reagent) |              | 13C4 PFOA                                          | 50 ug/mL      |
| ..LCMPFOS 00017       | 08/03/21 | Wellington Laboratories, Lot MPFOS0816    |                                |                      | (Purchased Reagent) |              | 13C4 PFOS                                          | 47.8 ug/mL    |
| ..LCMPFUDa 00009      | 02/12/21 | Wellington Laboratories, Lot MPFUDa0216   |                                |                      | (Purchased Reagent) |              | 13C2 PFUnA                                         | 50 ug/mL      |
| ..LCPFC2SP_00025      | 06/28/17 | 01/30/17                                  | Methanol, Lot 104453           | 10000 uL             | LCPFC2SP_00020      | 2000 uL      | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.0948 ug/mL  |
|                       |          |                                           |                                |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.0958 ug/mL  |
|                       |          |                                           |                                |                      |                     |              | N-ethylperfluoro-1-octanesulfo namide              | 0.1 ug/mL     |
|                       |          |                                           |                                |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 0.1 ug/mL     |
|                       |          |                                           |                                |                      |                     |              | MeFOSA                                             | 0.1 ug/mL     |
|                       |          |                                           |                                |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 0.1 ug/mL     |
| ..LCPFC2SP_00020      | 06/28/17 | 12/28/16                                  | Methanol, Lot 104453           | 10000 uL             | LC6:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.474 ug/mL   |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                              |                      | Reagent ID          | Volume Added |                                                    |               |
|                       |          |           |                              |                      | LC8:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.479 ug/mL   |
|                       |          |           |                              |                      | LCN-EtFOSA-M_00003  | 100 uL       | N-ethylperfluoro-1-octanesulfo<br>namide           | 0.5 ug/mL     |
|                       |          |           |                              |                      | LCN-EtFOSAA_00002   | 100 uL       | N-ethyl perfluorooctane<br>sulfonamidoacetic acid  | 0.5 ug/mL     |
|                       |          |           |                              |                      | LCN-MeFOSA-M_00002  | 100 uL       | MeFOSA                                             | 0.5 ug/mL     |
|                       |          |           |                              |                      | LCN-MeFOSAA_00003   | 100 uL       | N-methyl perfluorooctane<br>sulfonamidoacetic acid | 0.5 ug/mL     |
| ...LC6:2FTS_00002     | 06/25/21 |           | WELLINGTON, Lot 62FTS0616    |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ug/mL    |
| ...LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015    |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ug/mL    |
| ...LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NETFOSA0516M |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfo<br>namide           | 50 ug/mL      |
| ...LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NETFOSAA0116 |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane<br>sulfonamidoacetic acid  | 50 ug/mL      |
| ...LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M |                      | (Purchased Reagent) |              | MeFOSA                                             | 50 ug/mL      |
| ...LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116 |                      | (Purchased Reagent) |              | N-methyl perfluorooctane<br>sulfonamidoacetic acid | 50 ug/mL      |
| .LCPFCSP_00078        | 06/14/17 | 01/16/17  | Methanol, Lot 090285         | 10000 uL             | LCPFCSP_00075       | 2000 uL      | Perfluorobutyric acid                              | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)                | 0.0884 ug/mL  |
|                       |          |           |                              |                      |                     |              | Perfluorodecanoic acid                             | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorododecanoic acid                           | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorodecane Sulfonic acid                      | 0.0964 ug/mL  |
|                       |          |           |                              |                      |                     |              | Perfluoroheptanoic acid                            | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluoroheptanesulfonic Acid                      | 0.0952 ug/mL  |
|                       |          |           |                              |                      |                     |              | Perfluorohexanoic acid                             | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorohexadecanoic acid                         | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorohexanesulfonic acid                       | 0.091 ug/mL   |
|                       |          |           |                              |                      |                     |              | Perfluorononanoic acid                             | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorooctanoic acid (PFOA)                      | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorooctadecanoic acid                         | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)                | 0.0928 ug/mL  |
|                       |          |           |                              |                      |                     |              | Perfluorooctane Sulfonamide                        | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluoropentanoic acid                            | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorotetradecanoic acid                        | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorotridecanoic acid                          | 0.1 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluoroundecanoic acid                           | 0.1 ug/mL     |
| ..LCPFCSP_00075       | 06/14/17 | 12/14/16  | Methanol, Lot 090285         | 10000 uL             | LCPFCSP_00074       | 5000 uL      | Perfluorobutyric acid                              | 0.5 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)                | 0.442 ug/mL   |
|                       |          |           |                              |                      |                     |              | Perfluorodecanoic acid                             | 0.5 ug/mL     |
|                       |          |           |                              |                      |                     |              | Perfluorododecanoic acid                           | 0.5 ug/mL     |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID               | Exp Date  | Prep Date                                 | Dilutant Used        | Reagent Final Volume | Parent Reagent   |                                     | Analyte                               | Concentration |
|--------------------------|-----------|-------------------------------------------|----------------------|----------------------|------------------|-------------------------------------|---------------------------------------|---------------|
|                          |           |                                           |                      |                      | Reagent ID       | Volume Added                        |                                       |               |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorodecane Sulfonic acid         | 0.482 ug/mL   |
|                          |           |                                           |                      |                      |                  |                                     | Perfluoroheptanoic acid               | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluoroheptanesulfonic Acid         | 0.476 ug/mL   |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorohexanoic acid                | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorohexadecanoic acid            | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorohexanesulfonic acid          | 0.455 ug/mL   |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorononanoic acid                | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorooctanoic acid (PFOA)         | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorooctadecanoic acid            | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorooctanesulfonic acid (PFOS)   | 0.464 ug/mL   |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorooctane Sulfonamide           | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluoropentanoic acid               | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorotetradecanoic acid           | 0.5 ug/mL     |
|                          |           |                                           |                      |                      |                  |                                     | Perfluorotridecanoic acid             | 0.5 ug/mL     |
| Perfluoroundecanoic acid | 0.5 ug/mL |                                           |                      |                      |                  |                                     |                                       |               |
| ...LCPFCSP_00074         | 06/14/17  | 12/14/16                                  | Methanol, Lot 090285 | 10000 uL             | LCPFBA 00005     | 200 uL                              | Perfluorobutyric acid                 | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFBS_00005     | 200 uL                              | Perfluorobutanesulfonic acid (PFBS)   | 0.884 ug/mL   |
|                          |           |                                           |                      |                      | LCPFDA 00005     | 200 uL                              | Perfluorodecanoic acid                | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFDa 00005     | 200 uL                              | Perfluorododecanoic acid              | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFDS 00006     | 200 uL                              | Perfluorodecane Sulfonic acid         | 0.964 ug/mL   |
|                          |           |                                           |                      |                      | LCPFHpA 00006    | 200 uL                              | Perfluoroheptanoic acid               | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFHpS 00009    | 200 uL                              | Perfluoroheptanesulfonic Acid         | 0.952 ug/mL   |
|                          |           |                                           |                      |                      | LCPFHxA 00005    | 200 uL                              | Perfluorohexanoic acid                | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFHxDA 00006   | 200 uL                              | Perfluorohexadecanoic acid            | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFHxS-br 00002 | 200 uL                              | Perfluorohexanesulfonic acid          | 0.91 ug/mL    |
|                          |           |                                           |                      |                      | LCPFNA 00006     | 200 uL                              | Perfluorononanoic acid                | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFOA 00006     | 200 uL                              | Perfluorooctanoic acid (PFOA)         | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFODA 00006    | 200 uL                              | Perfluorooctadecanoic acid            | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFOS-br_00002  | 200 uL                              | Perfluorooctanesulfonic acid (PFOS)   | 0.928 ug/mL   |
|                          |           |                                           |                      |                      | LCPFOSA 00008    | 200 uL                              | Perfluorooctane Sulfonamide           | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFPeA 00005    | 200 uL                              | Perfluoropentanoic acid               | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFTeDA 00005   | 200 uL                              | Perfluorotetradecanoic acid           | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFTrDA 00005   | 200 uL                              | Perfluorotridecanoic acid             | 1 ug/mL       |
|                          |           |                                           |                      |                      | LCPFUdA 00005    | 200 uL                              | Perfluoroundecanoic acid              | 1 ug/mL       |
|                          |           |                                           |                      |                      | ....LCPFBA 00005 | 05/27/21                            | Wellington Laboratories, Lot PFBA0516 |               |
| ....LCPFBS_00005         | 03/15/21  | Wellington Laboratories, Lot LPFBS0316    |                      | (Purchased Reagent)  |                  | Perfluorobutanesulfonic acid (PFBS) | 44.2 ug/mL                            |               |
| ....LCPFDA 00005         | 07/02/20  | Wellington Laboratories, Lot PFDA0615     |                      | (Purchased Reagent)  |                  | Perfluorodecanoic acid              | 50 ug/mL                              |               |
| ....LCPFDa 00005         | 01/30/20  | Wellington Laboratories, Lot PFDoA0115    |                      | (Purchased Reagent)  |                  | Perfluorododecanoic acid            | 50 ug/mL                              |               |
| ....LCPFDS 00006         | 05/24/21  | Wellington Laboratories, Lot LPFDS0516    |                      | (Purchased Reagent)  |                  | Perfluorodecane Sulfonic acid       | 48.2 ug/mL                            |               |
| ....LCPFHpA 00006        | 01/22/21  | Wellington Laboratories, Lot PFHpA0116    |                      | (Purchased Reagent)  |                  | Perfluoroheptanoic acid             | 50 ug/mL                              |               |
| ....LCPFHpS 00009        | 11/06/20  | Wellington Laboratories, Lot LPFHpS1115   |                      | (Purchased Reagent)  |                  | Perfluoroheptanesulfonic Acid       | 47.6 ug/mL                            |               |
| ....LCPFHxA 00005        | 12/22/20  | Wellington Laboratories, Lot PFHxA1215    |                      | (Purchased Reagent)  |                  | Perfluorohexanoic acid              | 50 ug/mL                              |               |
| ....LCPFHxDA 00006       | 05/25/21  | Wellington Laboratories, Lot PFHxDA0516   |                      | (Purchased Reagent)  |                  | Perfluorohexadecanoic acid          | 50 ug/mL                              |               |
| ....LCPFHxS-br 00002     | 07/03/20  | Wellington Laboratories, Lot brPFHxSK0615 |                      | (Purchased Reagent)  |                  | Perfluorohexanesulfonic acid        | 45.5 ug/mL                            |               |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID          | Exp Date | Prep Date | Dilutant Used                            | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|---------------------|----------|-----------|------------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                     |          |           |                                          |                      | Reagent ID          | Volume Added |                                                    |               |
| ....LCPFNA 00006    | 10/23/20 |           | Wellington Laboratories, Lot PFNA1015    |                      | (Purchased Reagent) |              | Perfluorononanoic acid                             | 50 ug/mL      |
| ....LCPFOA 00006    | 11/06/20 |           | Wellington Laboratories, Lot PFOA1115    |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)                      | 50 ug/mL      |
| ....LCPFODA 00006   | 04/29/21 |           | Wellington Laboratories, Lot PFODA0416   |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid                         | 50 ug/mL      |
| ....LCPFOS-br_00002 | 10/14/20 |           | Wellington Laboratories, Lot brPFOSK1015 |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)                | 46.4 ug/mL    |
| ....LCPFOSA 00008   | 09/02/17 |           | Wellington Laboratories, Lot FOSA0815I   |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide                        | 50 ug/mL      |
| ....LCPFPeA 00005   | 01/30/20 |           | Wellington Laboratories, Lot PFPeA0115   |                      | (Purchased Reagent) |              | Perfluoropentanoic acid                            | 50 ug/mL      |
| ....LCPFTeDA 00005  | 12/09/20 |           | Wellington Laboratories, Lot PFTeDA1215  |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid                        | 50 ug/mL      |
| ....LCPFTrDA 00005  | 02/12/21 |           | Wellington Laboratories, Lot PFTTrDA0216 |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid                          | 50 ug/mL      |
| ....LCPFUDA 00005   | 08/19/20 |           | Wellington Laboratories, Lot PFUDA0815   |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid                           | 50 ug/mL      |
| LCPFC_FULL-L3_00001 | 06/14/17 | 02/16/17  | MeOH/H2O, Lot 090285                     | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                                       | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | d-N-MeFOSA-M                                       | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | d3-NMeFOSAA                                        | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | d5-NETFOSAA                                        | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | M2-6:2FTS                                          | 47.5 ng/mL    |
|                     |          |           |                                          |                      |                     |              | M2-8:2FTS                                          | 47.9 ng/mL    |
|                     |          |           |                                          |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                                        | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C2-PFTeDA                                        | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C4-PFHpA                                         | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C5-PFPeA                                         | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C8 FOSA                                          | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C4 PFBA                                          | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C2 PFDA                                          | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C2 PFDoA                                         | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C2 PFHxA                                         | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 18O2 PFHxS                                         | 47.3 ng/mL    |
|                     |          |           |                                          |                      |                     |              | 13C5 PFNA                                          | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C4 PFOA                                          | 50 ng/mL      |
|                     |          |           |                                          |                      |                     |              | 13C4 PFOS                                          | 47.8 ng/mL    |
|                     |          |           |                                          |                      |                     |              | 13C2 PFUnA                                         | 50 ng/mL      |
|                     |          |           |                                          |                      | LCPFC2SP_00025      | 250 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 4.74 ng/mL    |
|                     |          |           |                                          |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 4.79 ng/mL    |
|                     |          |           |                                          |                      |                     |              | N-ethylperfluoro-1-octanesulfo namide              | 5 ng/mL       |
|                     |          |           |                                          |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 5 ng/mL       |
|                     |          |           |                                          |                      |                     |              | MeFOSA                                             | 5 ng/mL       |
|                     |          |           |                                          |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 5 ng/mL       |
|                     |          |           |                                          |                      |                     |              | Perfluorobutyric acid                              | 5 ng/mL       |
|                     |          |           |                                          |                      | LCPFCSP_00078       | 250 uL       | Perfluorobutanesulfonic acid (PFBS)                | 4.42 ng/mL    |
|                     |          |           |                                          |                      |                     |              | Perfluorodecanoic acid                             | 5 ng/mL       |
|                     |          |           |                                          |                      |                     |              | Perfluorododecanoic acid                           | 5 ng/mL       |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|-----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                       |          |           |                                           |                      | Reagent ID          | Volume Added |                                     |               |
|                       |          |           |                                           |                      |                     |              | Perfluorodecane Sulfonic acid       | 4.82 ng/mL    |
|                       |          |           |                                           |                      |                     |              | Perfluoroheptanoic acid             | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluoroheptanesulfonic Acid       | 4.76 ng/mL    |
|                       |          |           |                                           |                      |                     |              | Perfluorohexanoic acid              | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorohexadecanoic acid          | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorohexanesulfonic acid        | 4.55 ng/mL    |
|                       |          |           |                                           |                      |                     |              | Perfluorononanoic acid              | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorooctanoic acid (PFOA)       | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorooctadecanoic acid          | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorooctanesulfonic acid (PFOS) | 4.64 ng/mL    |
|                       |          |           |                                           |                      |                     |              | Perfluorooctane Sulfonamide         | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluoropentanoic acid             | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorotetradecanoic acid         | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluorotridecanoic acid           | 5 ng/mL       |
|                       |          |           |                                           |                      |                     |              | Perfluoroundecanoic acid            | 5 ng/mL       |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17  | Methanol, Lot 104453                      | 50000 uL             | LCd-NETFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd5-NETFOSAA 00003 | 1000 uL      | d5-NETFOSAA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                           | 0.95 ug/mL    |
|                       |          |           |                                           |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                           | 0.958 ug/mL   |
| ..LCd-NETFOSA-M 00004 | 06/10/21 |           | WELLINGTON, Lot dNetFOSA0616M             |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                        | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 |           | WELLINGTON, Lot dNMeFOSA0616M             |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                        | 50 ug/mL      |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 |           | WELLINGTON, Lot d3NMeFOSAA0516            |                      | (Purchased Reagent) |              | d3-NMeFOSAA                         | 50 ug/mL      |
| ..LCd5-NETFOSAA 00003 | 08/02/21 |           | WELLINGTON, Lot d5NETFOSAA0716            |                      | (Purchased Reagent) |              | d5-NETFOSAA                         | 50 ug/mL      |
| ..LCM2-6:FTS 00003    | 01/08/21 |           | WELLINGTON, Lot M262FTS0116               |                      | (Purchased Reagent) |              | M2-6:2FTS                           | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003   | 01/08/21 |           | WELLINGTON, Lot M282FTS0116               |                      | (Purchased Reagent) |              | M2-8:2FTS                           | 47.9 ug/mL    |
| .LCMPFCSU_00047       | 06/14/17 | 12/14/16  | Methanol, Lot Baker 144541                | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM4PFHPA_00007     | 1000 uL      | 13C4-PFHpa                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM8FOSA_00011      | 1000 uL      | 13C8 FOSA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFBA_00008       | 1000 uL      | 13C4 PFBA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDA_00011       | 1000 uL      | 13C2 PFDA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDoA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxS_00008      | 1000 uL      | 18O2 PFHxS                          | 0.946 ug/mL   |
|                       |          |           |                                           |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOS_00017       | 1000 uL      | 13C4 PFOS                           | 0.956 ug/mL   |
|                       |          |           |                                           |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                          | 1 ug/mL       |
| ..LCM2PFHxDA_00008    | 01/07/21 |           | Wellington Laboratories, Lot M2PFHxDA1112 |                      | (Purchased Reagent) |              | 13C2-PFHxDA                         | 50 ug/mL      |
| ..LCM2PFTeDA_00007    | 12/07/20 |           | Wellington Laboratories, Lot M2PFTeDA1115 |                      | (Purchased Reagent) |              | 13C2-PFTeDA                         | 50 ug/mL      |
| ..LCM4PFHPA_00007     | 05/27/21 |           | Wellington Laboratories, Lot M4PFHPA0516  |                      | (Purchased Reagent) |              | 13C4-PFHpa                          | 50 ug/mL      |
| ..LCM5PFPEA_00008     | 05/22/20 |           | Wellington Laboratories, Lot M5PFPeA0515  |                      | (Purchased Reagent) |              | 13C5-PFPeA                          | 50 ug/mL      |
| ..LCM8FOSA_00011      | 12/22/17 |           | Wellington Laboratories, Lot M8FOSA1215I  |                      | (Purchased Reagent) |              | 13C8 FOSA                           | 50 ug/mL      |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

SDG No.:

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                           | Reagent Final Volume | Parent Reagent      |              | Analyte                                                  | Concentration |
|-----------------------|----------|-----------|-----------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------------|---------------|
|                       |          |           |                                         |                      | Reagent ID          | Volume Added |                                                          |               |
| ..LCMPFBA 00008       | 05/24/21 |           | Wellington Laboratories, Lot MPFBA0516  |                      | (Purchased Reagent) |              | 13C4 PFBA                                                | 50 ug/mL      |
| ..LCMPFDA 00011       | 08/19/20 |           | Wellington Laboratories, Lot MPFDA0815  |                      | (Purchased Reagent) |              | 13C2 PFDA                                                | 50 ug/mL      |
| ..LCMPFDoA 00008      | 04/08/21 |           | Wellington Laboratories, Lot MPFDoA0416 |                      | (Purchased Reagent) |              | 13C2 PFDoA                                               | 50 ug/mL      |
| ..LCMPFHxA 00012      | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416 |                      | (Purchased Reagent) |              | 13C2 PFHxA                                               | 50 ug/mL      |
| ..LCMPFHxS 00008      | 10/23/20 |           | Wellington Laboratories, Lot MPFHxS1015 |                      | (Purchased Reagent) |              | 18O2 PFHxS                                               | 47.3 ug/mL    |
| ..LCMPFNA 00008       | 04/13/19 |           | Wellington Laboratories, Lot MPFNA0414  |                      | (Purchased Reagent) |              | 13C5 PFNA                                                | 50 ug/mL      |
| ..LCMPFOA 00012       | 01/22/21 |           | Wellington Laboratories, Lot MPFOA0116  |                      | (Purchased Reagent) |              | 13C4 PFOA                                                | 50 ug/mL      |
| ..LCMPFOS 00017       | 08/03/21 |           | Wellington Laboratories, Lot MPFOS0816  |                      | (Purchased Reagent) |              | 13C4 PFOS                                                | 47.8 ug/mL    |
| ..LCMPFudA 00009      | 02/12/21 |           | Wellington Laboratories, Lot MPFudA0216 |                      | (Purchased Reagent) |              | 13C2 PFUnA                                               | 50 ug/mL      |
| ..LCPFC2SP_00025      | 06/28/17 | 01/30/17  | Methanol, Lot 104453                    | 10000 uL             | LCPFC2SP_00020      | 2000 uL      | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (6:2) | 0.0948 ug/mL  |
|                       |          |           |                                         |                      |                     |              | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (8:2) | 0.0958 ug/mL  |
|                       |          |           |                                         |                      |                     |              | N-ethylperfluoro-1-octanesulfo<br>namide                 | 0.1 ug/mL     |
|                       |          |           |                                         |                      |                     |              | N-ethyl perfluorooctane<br>sulfonamidoacetic acid        | 0.1 ug/mL     |
|                       |          |           |                                         |                      |                     |              | MeFOSA                                                   | 0.1 ug/mL     |
|                       |          |           |                                         |                      |                     |              | N-methyl perfluorooctane<br>sulfonamidoacetic acid       | 0.1 ug/mL     |
| ..LCPFC2SP_00020      | 06/28/17 | 12/28/16  | Methanol, Lot 104453                    | 10000 uL             | LC6:2FTS_00002      | 100 uL       | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (6:2) | 0.474 ug/mL   |
|                       |          |           |                                         |                      | LC8:2FTS_00002      | 100 uL       | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (8:2) | 0.479 ug/mL   |
|                       |          |           |                                         |                      | LCN-EtFOSA-M_00003  | 100 uL       | N-ethylperfluoro-1-octanesulfo<br>namide                 | 0.5 ug/mL     |
|                       |          |           |                                         |                      | LCN-EtFOSAA_00002   | 100 uL       | N-ethyl perfluorooctane<br>sulfonamidoacetic acid        | 0.5 ug/mL     |
|                       |          |           |                                         |                      | LCN-MeFOSA-M_00002  | 100 uL       | MeFOSA                                                   | 0.5 ug/mL     |
|                       |          |           |                                         |                      | LCN-MeFOSAA_00003   | 100 uL       | N-methyl perfluorooctane<br>sulfonamidoacetic acid       | 0.5 ug/mL     |
| ...LC6:2FTS_00002     | 06/25/21 |           | WELLINGTON, Lot 62FTS0616               |                      | (Purchased Reagent) |              | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (6:2) | 47.4 ug/mL    |
| ...LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015               |                      | (Purchased Reagent) |              | Sodium<br>1H,1H,2H,2H-perfluorooctane<br>sulfonate (8:2) | 47.9 ug/mL    |
| ...LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NetFOSA0516M            |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfo<br>namide                 | 50 ug/mL      |
| ...LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NetFOSAA0116            |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane<br>sulfonamidoacetic acid        | 50 ug/mL      |
| ...LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M            |                      | (Purchased Reagent) |              | MeFOSA                                                   | 50 ug/mL      |
| ...LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116            |                      | (Purchased Reagent) |              | N-methyl perfluorooctane<br>sulfonamidoacetic acid       | 50 ug/mL      |
| ..LCPFCSP_00078       | 06/14/17 | 01/16/17  | Methanol, Lot 090285                    | 10000 uL             | LCPFCSP_00075       | 2000 uL      | Perfluorobutyric acid                                    | 0.1 ug/mL     |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID       | Exp Date | Prep Date | Dilutant Used        | Reagent Final Volume | Parent Reagent |              | Analyte                             | Concentration |
|------------------|----------|-----------|----------------------|----------------------|----------------|--------------|-------------------------------------|---------------|
|                  |          |           |                      |                      | Reagent ID     | Volume Added |                                     |               |
|                  |          |           |                      |                      |                |              | Perfluorobutanesulfonic acid (PFBS) | 0.0884 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorodecanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorododecanoic acid            | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorodecane Sulfonic acid       | 0.0964 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluoroheptanoic acid             | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroheptanesulfonic Acid       | 0.0952 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorohexanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexadecanoic acid          | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexanesulfonic acid        | 0.091 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorononanoic acid              | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanoic acid (PFOA)       | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctadecanoic acid          | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanesulfonic acid (PFOS) | 0.0928 ug/mL  |
|                  |          |           |                      |                      |                |              | Perfluorooctane Sulfonamide         | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoropentanoic acid             | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotetradecanoic acid         | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotridecanoic acid           | 0.1 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroundecanoic acid            | 0.1 ug/mL     |
| ..LCPFCSP_00075  | 06/14/17 | 12/14/16  | Methanol, Lot 090285 | 10000 uL             | LCPFCSP_00074  | 5000 uL      | Perfluorobutyric acid               | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorobutanesulfonic acid (PFBS) | 0.442 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorodecanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorododecanoic acid            | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorodecane Sulfonic acid       | 0.482 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluoroheptanoic acid             | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroheptanesulfonic Acid       | 0.476 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorohexanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexadecanoic acid          | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorohexanesulfonic acid        | 0.455 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorononanoic acid              | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanoic acid (PFOA)       | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctadecanoic acid          | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorooctanesulfonic acid (PFOS) | 0.464 ug/mL   |
|                  |          |           |                      |                      |                |              | Perfluorooctane Sulfonamide         | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoropentanoic acid             | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotetradecanoic acid         | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluorotridecanoic acid           | 0.5 ug/mL     |
|                  |          |           |                      |                      |                |              | Perfluoroundecanoic acid            | 0.5 ug/mL     |
| ...LCPFCSP_00074 | 06/14/17 | 12/14/16  | Methanol, Lot 090285 | 10000 uL             | LCPFBA_00005   | 200 uL       | Perfluorobutyric acid               | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFBS_00005   | 200 uL       | Perfluorobutanesulfonic acid (PFBS) | 0.884 ug/mL   |
|                  |          |           |                      |                      | LCPFDA_00005   | 200 uL       | Perfluorodecanoic acid              | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFDoA_00005  | 200 uL       | Perfluorododecanoic acid            | 1 ug/mL       |
|                  |          |           |                      |                      | LCPFDS_00006   | 200 uL       | Perfluorodecane Sulfonic acid       | 0.964 ug/mL   |
|                  |          |           |                      |                      | LCPFHpA_00006  | 200 uL       | Perfluoroheptanoic acid             | 1 ug/mL       |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date                                 | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|----------------------|----------|-------------------------------------------|----------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                      |          |                                           |                      |                      | Reagent ID          | Volume Added |                                     |               |
|                      |          |                                           |                      |                      | LCPFHpS_00009       | 200 uL       | Perfluoroheptanesulfonic Acid       | 0.952 ug/mL   |
|                      |          |                                           |                      |                      | LCPFHxA_00005       | 200 uL       | Perfluorohexanoic acid              | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFHxDA_00006      | 200 uL       | Perfluorohexadecanoic acid          | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFHxS-br_00002    | 200 uL       | Perfluorohexanesulfonic acid        | 0.91 ug/mL    |
|                      |          |                                           |                      |                      | LCPFNA_00006        | 200 uL       | Perfluorononanoic acid              | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFOA_00006        | 200 uL       | Perfluorooctanoic acid (PFOA)       | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFODA_00006       | 200 uL       | Perfluorooctadecanoic acid          | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFOS-br_00002     | 200 uL       | Perfluorooctanesulfonic acid (PFOS) | 0.928 ug/mL   |
|                      |          |                                           |                      |                      | LCPFOSA_00008       | 200 uL       | Perfluorooctane Sulfonamide         | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFPeA_00005       | 200 uL       | Perfluoropentanoic acid             | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFTEda_00005      | 200 uL       | Perfluorotetradecanoic acid         | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFTrDA_00005      | 200 uL       | Perfluorotridecanoic acid           | 1 ug/mL       |
|                      |          |                                           |                      |                      | LCPFUDa_00005       | 200 uL       | Perfluoroundecanoic acid            | 1 ug/mL       |
| ....LCPFBA_00005     | 05/27/21 | Wellington Laboratories, Lot PFBA0516     |                      |                      | (Purchased Reagent) |              | Perfluorobutyric acid               | 50 ug/mL      |
| ....LCPFBS_00005     | 03/15/21 | Wellington Laboratories, Lot LPFBS0316    |                      |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS) | 44.2 ug/mL    |
| ....LCPFDA_00005     | 07/02/20 | Wellington Laboratories, Lot PFDA0615     |                      |                      | (Purchased Reagent) |              | Perfluorodecanoic acid              | 50 ug/mL      |
| ....LCPFDaA_00005    | 01/30/20 | Wellington Laboratories, Lot PFDoA0115    |                      |                      | (Purchased Reagent) |              | Perfluorododecanoic acid            | 50 ug/mL      |
| ....LCPFDS_00006     | 05/24/21 | Wellington Laboratories, Lot LPFDS0516    |                      |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonic acid       | 48.2 ug/mL    |
| ....LCPFHpA_00006    | 01/22/21 | Wellington Laboratories, Lot PFHpA0116    |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid             | 50 ug/mL      |
| ....LCPFHpS_00009    | 11/06/20 | Wellington Laboratories, Lot LPFHpS1115   |                      |                      | (Purchased Reagent) |              | Perfluoroheptanesulfonic Acid       | 47.6 ug/mL    |
| ....LCPFHxA_00005    | 12/22/20 | Wellington Laboratories, Lot PFHxA1215    |                      |                      | (Purchased Reagent) |              | Perfluorohexanoic acid              | 50 ug/mL      |
| ....LCPFHxDA_00006   | 05/25/21 | Wellington Laboratories, Lot PFHxDA0516   |                      |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid          | 50 ug/mL      |
| ....LCPFHxS-br_00002 | 07/03/20 | Wellington Laboratories, Lot brPFHxSK0615 |                      |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid        | 45.5 ug/mL    |
| ....LCPFNA_00006     | 10/23/20 | Wellington Laboratories, Lot PFNA1015     |                      |                      | (Purchased Reagent) |              | Perfluorononanoic acid              | 50 ug/mL      |
| ....LCPFOA_00006     | 11/06/20 | Wellington Laboratories, Lot PFOA1115     |                      |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)       | 50 ug/mL      |
| ....LCPFODA_00006    | 04/29/21 | Wellington Laboratories, Lot PFODA0416    |                      |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid          | 50 ug/mL      |
| ....LCPFOS-br_00002  | 10/14/20 | Wellington Laboratories, Lot brPFOSK1015  |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 46.4 ug/mL    |
| ....LCPFOSA_00008    | 09/02/17 | Wellington Laboratories, Lot FOSA0815I    |                      |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide         | 50 ug/mL      |
| ....LCPFPeA_00005    | 01/30/20 | Wellington Laboratories, Lot PFPeA0115    |                      |                      | (Purchased Reagent) |              | Perfluoropentanoic acid             | 50 ug/mL      |
| ....LCPFTEda_00005   | 12/09/20 | Wellington Laboratories, Lot PFTeDA1215   |                      |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid         | 50 ug/mL      |
| ....LCPFTrDA_00005   | 02/12/21 | Wellington Laboratories, Lot PFTrDA0216   |                      |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid           | 50 ug/mL      |
| ....LCPFUDa_00005    | 08/19/20 | Wellington Laboratories, Lot PFUDa0815    |                      |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid            | 50 ug/mL      |
| LCPFC_FULL-L4_00001  | 06/14/17 | 02/16/17                                  | MeOH/H2O, Lot 090285 | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                        | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | d-N-MeFOSA-M                        | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | d3-NMeFOSAA                         | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | d5-NETFOSAA                         | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | M2-6:2FTS                           | 47.5 ng/mL    |
|                      |          |                                           |                      |                      |                     |              | M2-8:2FTS                           | 47.9 ng/mL    |
|                      |          |                                           |                      |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                         | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C2-PFTeDA                         | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C4-PFHpA                          | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C5-PFPeA                          | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C8 FOSA                           | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C4 PFBA                           | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              | 13C2 PFDA                           | 50 ng/mL      |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |
|                      |          |                                           |                      |                      |                     |              |                                     |               |



## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

SDG No.:

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                 | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|-------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                               |                      | Reagent ID          | Volume Added |                                                    |               |
|                       |          |           |                               |                      |                     |              | 13C2 PFDoA                                         | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C2 PFHxA                                         | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 18O2 PFHxS                                         | 47.3 ng/mL    |
|                       |          |           |                               |                      |                     |              | 13C5 PFNA                                          | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C4 PFOA                                          | 50 ng/mL      |
|                       |          |           |                               |                      |                     |              | 13C4 PFOS                                          | 47.8 ng/mL    |
|                       |          |           |                               |                      |                     |              | 13C2 PFUnA                                         | 50 ng/mL      |
|                       |          |           |                               |                      | LCPFC2SP_00026      | 200 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 18.96 ng/mL   |
|                       |          |           |                               |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 19.16 ng/mL   |
|                       |          |           |                               |                      |                     |              | N-ethylperfluoro-1-octanesulfonamide               | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | MeFOSA                                             | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              |                                                    |               |
|                       |          |           |                               |                      | LCPFCSP_00074       | 100 uL       | Perfluorobutyric acid                              | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)                | 17.68 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorodecanoic acid                             | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorododecanoic acid                           | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorodecane Sulfonic acid                      | 19.28 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluoroheptanoic acid                            | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluoroheptanesulfonic Acid                      | 19.04 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorohexanoic acid                             | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorohexadecanoic acid                         | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorohexanesulfonic acid                       | 18.2 ng/mL    |
|                       |          |           |                               |                      |                     |              | Perfluorononanoic acid                             | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorooctanoic acid (PFOA)                      | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorooctadecanoic acid                         | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)                | 18.56 ng/mL   |
|                       |          |           |                               |                      |                     |              | Perfluorooctane Sulfonamide                        | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluoropentanoic acid                            | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorotetradecanoic acid                        | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluorotridecanoic acid                          | 20 ng/mL      |
|                       |          |           |                               |                      |                     |              | Perfluoroundecanoic acid                           | 20 ng/mL      |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17  | Methanol, Lot 104453          | 50000 uL             | LCd-NEtFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                               |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                               |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                                        | 1 ug/mL       |
|                       |          |           |                               |                      | LCd5-NEtFOSAA 00003 | 1000 uL      | d5-NEtFOSAA                                        | 1 ug/mL       |
|                       |          |           |                               |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                                          | 0.95 ug/mL    |
|                       |          |           |                               |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                                          | 0.958 ug/mL   |
| ..LCd-NEtFOSA-M 00004 | 06/10/21 |           | WELLINGTON, Lot dNetFOSA0616M |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                                       | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 |           | WELLINGTON, Lot dNMeFOSA0616M |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                                       | 50 ug/mL      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                                           |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 |           | WELLINGTON, Lot d3NMeFOSAA0516            |                      | (Purchased Reagent) |              | d3-NMeFOSAA                                        | 50 ug/mL      |
| ..LCd5-NEtFOSAA 00003 | 08/02/21 |           | WELLINGTON, Lot d5NEtFOSAA0716            |                      | (Purchased Reagent) |              | d5-NEtFOSAA                                        | 50 ug/mL      |
| ..LCM2-6:FTS 00003    | 01/08/21 |           | WELLINGTON, Lot M262FTS0116               |                      | (Purchased Reagent) |              | M2-6:2FTS                                          | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003   | 01/08/21 |           | WELLINGTON, Lot M282FTS0116               |                      | (Purchased Reagent) |              | M2-8:2FTS                                          | 47.9 ug/mL    |
| ..LCMPFCSU_00047      | 06/14/17 | 12/14/16  | Methanol, Lot Baker 144541                | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM4PFHFA_00007     | 1000 uL      | 13C4-PFHpa                                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM8FOSA_00011      | 1000 uL      | 13C8 FOSA                                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFBA_00008       | 1000 uL      | 13C4 PFBA                                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDA_00011       | 1000 uL      | 13C2 PFDA                                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDoA                                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxS_00008      | 1000 uL      | 18O2 PFHxS                                         | 0.946 ug/mL   |
|                       |          |           |                                           |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOS_00017       | 1000 uL      | 13C4 PFOS                                          | 0.956 ug/mL   |
|                       |          |           |                                           |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                                         | 1 ug/mL       |
| ..LCM2PFHxDA 00008    | 01/07/21 |           | Wellington Laboratories, Lot M2PFHxDA1112 |                      | (Purchased Reagent) |              | 13C2-PFHxDA                                        | 50 ug/mL      |
| ..LCM2PFTeDA 00007    | 12/07/20 |           | Wellington Laboratories, Lot M2PFTeDA1115 |                      | (Purchased Reagent) |              | 13C2-PFTeDA                                        | 50 ug/mL      |
| ..LCM4PFHFA 00007     | 05/27/21 |           | Wellington Laboratories, Lot M4PFHFA0516  |                      | (Purchased Reagent) |              | 13C4-PFHpa                                         | 50 ug/mL      |
| ..LCM5PFPEA 00008     | 05/22/20 |           | Wellington Laboratories, Lot M5PFPeA0515  |                      | (Purchased Reagent) |              | 13C5-PFPeA                                         | 50 ug/mL      |
| ..LCM8FOSA 00011      | 12/22/17 |           | Wellington Laboratories, Lot M8FOSA1215I  |                      | (Purchased Reagent) |              | 13C8 FOSA                                          | 50 ug/mL      |
| ..LCMPFBA 00008       | 05/24/21 |           | Wellington Laboratories, Lot MPFBA0516    |                      | (Purchased Reagent) |              | 13C4 PFBA                                          | 50 ug/mL      |
| ..LCMPFDA 00011       | 08/19/20 |           | Wellington Laboratories, Lot MPFDA0815    |                      | (Purchased Reagent) |              | 13C2 PFDA                                          | 50 ug/mL      |
| ..LCMPFDoA 00008      | 04/08/21 |           | Wellington Laboratories, Lot MPFDoA0416   |                      | (Purchased Reagent) |              | 13C2 PFDoA                                         | 50 ug/mL      |
| ..LCMPFHxA 00012      | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416   |                      | (Purchased Reagent) |              | 13C2 PFHxA                                         | 50 ug/mL      |
| ..LCMPFHxS 00008      | 10/23/20 |           | Wellington Laboratories, Lot MPFHxS1015   |                      | (Purchased Reagent) |              | 18O2 PFHxS                                         | 47.3 ug/mL    |
| ..LCMPFNA 00008       | 04/13/19 |           | Wellington Laboratories, Lot MPFNA0414    |                      | (Purchased Reagent) |              | 13C5 PFNA                                          | 50 ug/mL      |
| ..LCMPFOA 00012       | 01/22/21 |           | Wellington Laboratories, Lot MPFOA0116    |                      | (Purchased Reagent) |              | 13C4 PFOA                                          | 50 ug/mL      |
| ..LCMPFOS 00017       | 08/03/21 |           | Wellington Laboratories, Lot MPFOS0816    |                      | (Purchased Reagent) |              | 13C4 PFOS                                          | 47.8 ug/mL    |
| ..LCMPFUDa 00009      | 02/12/21 |           | Wellington Laboratories, Lot MPFUDa0216   |                      | (Purchased Reagent) |              | 13C2 PFUnA                                         | 50 ug/mL      |
| ..LCPPC2SP_00026      | 07/30/17 | 01/30/17  | Methanol, Lot 104453                      | 10000 uL             | LC6:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.474 ug/mL   |
|                       |          |           |                                           |                      | LC8:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.479 ug/mL   |
|                       |          |           |                                           |                      | LCN-EtFOSA-M_00003  | 100 uL       | N-ethylperfluoro-1-octanesulfo namide              | 0.5 ug/mL     |
|                       |          |           |                                           |                      | LCN-EtFOSAA_00002   | 100 uL       | N-ethyl perfluorooctane sulfonamidoacetic acid     | 0.5 ug/mL     |
|                       |          |           |                                           |                      | LCN-MeFOSA-M_00002  | 100 uL       | MeFOSA                                             | 0.5 ug/mL     |
|                       |          |           |                                           |                      | LCN-MeFOSAA_00003   | 100 uL       | N-methyl perfluorooctane sulfonamidoacetic acid    | 0.5 ug/mL     |
| ..LC6:2FTS_00002      | 06/25/21 |           | WELLINGTON, Lot 62FTS0616                 |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ug/mL    |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                      |          |           |                                           |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015                 |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ug/mL    |
| ..LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NETFOSA0516M              |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfonamide               | 50 ug/mL      |
| ..LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NETFOSAA0116              |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 50 ug/mL      |
| ..LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M              |                      | (Purchased Reagent) |              | MeFOSA                                             | 50 ug/mL      |
| ..LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116              |                      | (Purchased Reagent) |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 50 ug/mL      |
| .LCPFCSP_00074       | 06/14/17 | 12/14/16  | Methanol, Lot 090285                      | 10000 uL             | LCPFBA_00005        | 200 uL       | Perfluorobutyric acid                              | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFBS_00005        | 200 uL       | Perfluorobutanesulfonic acid (PFBS)                | 0.884 ug/mL   |
|                      |          |           |                                           |                      | LCPFDA_00005        | 200 uL       | Perfluorodecanoic acid                             | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFDoA_00005       | 200 uL       | Perfluorododecanoic acid                           | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFDS_00006        | 200 uL       | Perfluorodecane Sulfonic acid                      | 0.964 ug/mL   |
|                      |          |           |                                           |                      | LCPFHpA_00006       | 200 uL       | Perfluoroheptanoic acid                            | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFHpS_00009       | 200 uL       | Perfluoroheptanesulfonic Acid                      | 0.952 ug/mL   |
|                      |          |           |                                           |                      | LCPFHxA_00005       | 200 uL       | Perfluorohexanoic acid                             | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFHxDA_00006      | 200 uL       | Perfluorohexadecanoic acid                         | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFHxS-br_00002    | 200 uL       | Perfluorohexanesulfonic acid                       | 0.91 ug/mL    |
|                      |          |           |                                           |                      | LCPFNA_00006        | 200 uL       | Perfluorononanoic acid                             | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFOA_00006        | 200 uL       | Perfluorooctanoic acid (PFOA)                      | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFODA_00006       | 200 uL       | Perfluorooctadecanoic acid                         | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFOS-br_00002     | 200 uL       | Perfluorooctanesulfonic acid (PFOS)                | 0.928 ug/mL   |
|                      |          |           |                                           |                      | LCPFOSA_00008       | 200 uL       | Perfluorooctane Sulfonamide                        | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFPeA_00005       | 200 uL       | Perfluoropentanoic acid                            | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFTEdA_00005      | 200 uL       | Perfluorotetradecanoic acid                        | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFTrDA_00005      | 200 uL       | Perfluorotridecanoic acid                          | 1 ug/mL       |
|                      |          |           |                                           |                      | LCPFUdA_00005       | 200 uL       | Perfluoroundecanoic acid                           | 1 ug/mL       |
| ..LCPFBA_00005       | 05/27/21 |           | Wellington Laboratories, Lot PFBA0516     |                      | (Purchased Reagent) |              | Perfluorobutyric acid                              | 50 ug/mL      |
| ..LCPFBS_00005       | 03/15/21 |           | Wellington Laboratories, Lot LPFBS0316    |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)                | 44.2 ug/mL    |
| ..LCPFDA_00005       | 07/02/20 |           | Wellington Laboratories, Lot PFDA0615     |                      | (Purchased Reagent) |              | Perfluorodecanoic acid                             | 50 ug/mL      |
| ..LCPFDoA_00005      | 01/30/20 |           | Wellington Laboratories, Lot PFDoA0115    |                      | (Purchased Reagent) |              | Perfluorododecanoic acid                           | 50 ug/mL      |
| ..LCPFDS_00006       | 05/24/21 |           | Wellington Laboratories, Lot LPFDS0516    |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonic acid                      | 48.2 ug/mL    |
| ..LCPFHpA_00006      | 01/22/21 |           | Wellington Laboratories, Lot PFHpA0116    |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid                            | 50 ug/mL      |
| ..LCPFHpS_00009      | 11/06/20 |           | Wellington Laboratories, Lot LPFHpS1115   |                      | (Purchased Reagent) |              | Perfluoroheptanesulfonic Acid                      | 47.6 ug/mL    |
| ..LCPFHxA_00005      | 12/22/20 |           | Wellington Laboratories, Lot PFHxA1215    |                      | (Purchased Reagent) |              | Perfluorohexanoic acid                             | 50 ug/mL      |
| ..LCPFHxDA_00006     | 05/25/21 |           | Wellington Laboratories, Lot PFHxDA0516   |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid                         | 50 ug/mL      |
| ..LCPFHxS-br_00002   | 07/03/20 |           | Wellington Laboratories, Lot brPFHxSK0615 |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid                       | 45.5 ug/mL    |
| ..LCPFNA_00006       | 10/23/20 |           | Wellington Laboratories, Lot PFNA1015     |                      | (Purchased Reagent) |              | Perfluorononanoic acid                             | 50 ug/mL      |
| ..LCPFOA_00006       | 11/06/20 |           | Wellington Laboratories, Lot PFOA1115     |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)                      | 50 ug/mL      |
| ..LCPFODA_00006      | 04/29/21 |           | Wellington Laboratories, Lot PFODA0416    |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid                         | 50 ug/mL      |
| ..LCPFOS-br_00002    | 10/14/20 |           | Wellington Laboratories, Lot brPFOSK1015  |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)                | 46.4 ug/mL    |
| ..LCPFOSA_00008      | 09/02/17 |           | Wellington Laboratories, Lot FOSA0815I    |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide                        | 50 ug/mL      |
| ..LCPFPeA_00005      | 01/30/20 |           | Wellington Laboratories, Lot PFPeA0115    |                      | (Purchased Reagent) |              | Perfluoropentanoic acid                            | 50 ug/mL      |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID                 | Exp Date | Prep Date | Dilutant Used                           | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|----------------------------|----------|-----------|-----------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                            |          |           |                                         |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LCPFTeDA_00005           | 12/09/20 |           | Wellington Laboratories, Lot PFTeDA1215 |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid                        | 50 ug/mL      |
| ..LCPFTrDA_00005           | 02/12/21 |           | Wellington Laboratories, Lot PFTrDA0216 |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid                          | 50 ug/mL      |
| ..LCPFUdA_00005            | 08/19/20 |           | Wellington Laboratories, Lot PFUdA0815  |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid                           | 50 ug/mL      |
| <b>LCPFC_FULL-L5_00001</b> | 06/14/17 | 02/16/17  | MeOH/H2O, Lot 090285                    | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                                       | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | d-N-MeFOSA-M                                       | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | d3-NMeFOSAA                                        | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | d5-NEtFOSAA                                        | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | M2-6:2FTS                                          | 47.5 ng/mL    |
|                            |          |           |                                         |                      |                     |              | M2-8:2FTS                                          | 47.9 ng/mL    |
|                            |          |           |                                         |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                                        | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C2-PFTeDA                                        | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C4-PFHpA                                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C5-PFPeA                                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C8 FOSA                                          | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C4 PFBA                                          | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C2 PFDA                                          | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C2 PFDoA                                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C2 PFHxA                                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 18O2 PFHxS                                         | 47.3 ng/mL    |
|                            |          |           |                                         |                      |                     |              | 13C5 PFNA                                          | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C4 PFOA                                          | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | 13C4 PFOS                                          | 47.8 ng/mL    |
|                            |          |           |                                         |                      | LCPFC2SP_00026      | 500 uL       | 13C2 PFUnA                                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ng/mL    |
|                            |          |           |                                         |                      |                     |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ng/mL    |
|                            |          |           |                                         |                      |                     |              | N-ethylperfluoro-1-octanesulfoamide                | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | MeFOSA                                             | 50 ng/mL      |
|                            |          |           |                                         |                      | LCPFCSP_00074       | 250 uL       | N-methyl perfluorooctane sulfonamidoacetic acid    | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorobutyric acid                              | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorobutanesulfonic acid (PFBS)                | 44.2 ng/mL    |
|                            |          |           |                                         |                      |                     |              | Perfluorodecanoic acid                             | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorododecanoic acid                           | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorodecane Sulfonic acid                      | 48.2 ng/mL    |
|                            |          |           |                                         |                      |                     |              | Perfluoroheptanoic acid                            | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluoroheptanesulfonic Acid                      | 47.6 ng/mL    |
|                            |          |           |                                         |                      |                     |              | Perfluorohexanoic acid                             | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorohexadecanoic acid                         | 50 ng/mL      |
|                            |          |           |                                         |                      |                     |              | Perfluorohexanesulfonic acid                       | 45.5 ng/mL    |
|                            |          |           |                                         |                      |                     |              | Perfluorononanoic acid                             | 50 ng/mL      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date                                | Dilutant Used              | Reagent Final Volume | Parent Reagent      |              | Analyte                                   | Concentration |  |                     |  |             |          |
|-----------------------|----------|------------------------------------------|----------------------------|----------------------|---------------------|--------------|-------------------------------------------|---------------|--|---------------------|--|-------------|----------|
|                       |          |                                          |                            |                      | Reagent ID          | Volume Added |                                           |               |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorooctanoic acid (PFOA)             | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorooctadecanoic acid                | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorooctanesulfonic acid (PFOS)       | 46.4 ng/mL    |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorooctane Sulfonamide               | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluoropentanoic acid                   | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorotetradecanoic acid               | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluorotridecanoic acid                 | 50 ng/mL      |  |                     |  |             |          |
|                       |          |                                          |                            |                      |                     |              | Perfluoroundecanoic acid                  | 50 ng/mL      |  |                     |  |             |          |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17                                 | Methanol, Lot 104453       | 50000 uL             | LCd-NEtFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                              | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                              | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                               | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCd5-NEtFOSAA 00003 | 1000 uL      | d5-NEtFOSAA                               | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                                 | 0.95 ug/mL    |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                                 | 0.958 ug/mL   |  |                     |  |             |          |
| ..LCd-NEtFOSA-M 00004 | 06/10/21 | WELLINGTON, Lot dNEtFOSA0616M            |                            |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                              | 50 ug/mL      |  |                     |  |             |          |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 | WELLINGTON, Lot dNMeFOSA0616M            |                            |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                              | 50 ug/mL      |  |                     |  |             |          |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 | WELLINGTON, Lot d3NMeFOSAA0516           |                            |                      | (Purchased Reagent) |              | d3-NMeFOSAA                               | 50 ug/mL      |  |                     |  |             |          |
| ..LCd5-NEtFOSAA 00003 | 08/02/21 | WELLINGTON, Lot d5NEtFOSAA0716           |                            |                      | (Purchased Reagent) |              | d5-NEtFOSAA                               | 50 ug/mL      |  |                     |  |             |          |
| ..LCM2-6:FTS 00003    | 01/08/21 | WELLINGTON, Lot M262FTS0116              |                            |                      | (Purchased Reagent) |              | M2-6:2FTS                                 | 47.5 ug/mL    |  |                     |  |             |          |
| ..LCM2-8:2FTS 00003   | 01/08/21 | WELLINGTON, Lot M282FTS0116              |                            |                      | (Purchased Reagent) |              | M2-8:2FTS                                 | 47.9 ug/mL    |  |                     |  |             |          |
| .LCMPFCSU_00047       | 06/14/17 | 12/14/16                                 | Methanol, Lot Baker 144541 | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                               | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                               | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM4PFHPA_00007     | 1000 uL      | 13C4-PFHpa                                | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                                | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCM8FOSA_00011      | 1000 uL      | 13C8_FOSA                                 | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFBA_00008       | 1000 uL      | 13C4_PFBA                                 | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFDA_00011       | 1000 uL      | 13C2_PFDA                                 | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFDoA_00008      | 1000 uL      | 13C2_PFDoA                                | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFHxA_00012      | 1000 uL      | 13C2_PFHxA                                | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFHxS_00008      | 1000 uL      | 1802_PFHxS                                | 0.946 ug/mL   |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFNA_00008       | 1000 uL      | 13C5_PFNA                                 | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFOA_00012       | 1000 uL      | 13C4_PFOA                                 | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFOS_00017       | 1000 uL      | 13C4_PFOS                                 | 0.956 ug/mL   |  |                     |  |             |          |
|                       |          |                                          |                            |                      | LCMPFUdA_00009      | 1000 uL      | 13C2_PFUdA                                | 1 ug/mL       |  |                     |  |             |          |
|                       |          |                                          |                            |                      | ..LCM2PFHxDA_00008  | 01/07/21     | Wellington Laboratories, Lot M2PFHxDA1112 |               |  | (Purchased Reagent) |  | 13C2-PFHxDA | 50 ug/mL |
|                       |          |                                          |                            |                      | ..LCM2PFTeDA_00007  | 12/07/20     | Wellington Laboratories, Lot M2PFTeDA1115 |               |  | (Purchased Reagent) |  | 13C2-PFTeDA | 50 ug/mL |
| ..LCM4PFHPA_00007     | 05/27/21 | Wellington Laboratories, Lot M4PFHpA0516 |                            |                      | (Purchased Reagent) |              | 13C4-PFHpa                                | 50 ug/mL      |  |                     |  |             |          |
| ..LCM5PFPEA_00008     | 05/22/20 | Wellington Laboratories, Lot M5PFPeA0515 |                            |                      | (Purchased Reagent) |              | 13C5-PFPeA                                | 50 ug/mL      |  |                     |  |             |          |
| ..LCM8FOSA_00011      | 12/22/17 | Wellington Laboratories, Lot M8FOSA1215I |                            |                      | (Purchased Reagent) |              | 13C8_FOSA                                 | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFBA_00008       | 05/24/21 | Wellington Laboratories, Lot MPFBA0516   |                            |                      | (Purchased Reagent) |              | 13C4_PFBA                                 | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFDA_00011       | 08/19/20 | Wellington Laboratories, Lot MPFDA0815   |                            |                      | (Purchased Reagent) |              | 13C2_PFDA                                 | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFDoA_00008      | 04/08/21 | Wellington Laboratories, Lot MPFDoA0416  |                            |                      | (Purchased Reagent) |              | 13C2_PFDoA                                | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFHxA_00012      | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416  |                            |                      | (Purchased Reagent) |              | 13C2_PFHxA                                | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFHxS_00008      | 10/23/20 | Wellington Laboratories, Lot MPFHxS1015  |                            |                      | (Purchased Reagent) |              | 1802_PFHxS                                | 47.3 ug/mL    |  |                     |  |             |          |
| ..LCMPFNA_00008       | 04/13/19 | Wellington Laboratories, Lot MPFNA0414   |                            |                      | (Purchased Reagent) |              | 13C5_PFNA                                 | 50 ug/mL      |  |                     |  |             |          |
| ..LCMPFOA_00012       | 01/22/21 | Wellington Laboratories, Lot MPFOA0116   |                            |                      | (Purchased Reagent) |              | 13C4_PFOA                                 | 50 ug/mL      |  |                     |  |             |          |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date | Dilutant Used                           | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|----------------------|----------|-----------|-----------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                      |          |           |                                         |                      | Reagent ID          | Volume Added |                                                    |               |
| ..LCMPFOS_00017      | 08/03/21 |           | Wellington Laboratories, Lot MPFOS0816  |                      | (Purchased Reagent) |              | 13C4 PFOS                                          | 47.8 ug/mL    |
| ..LCMPFUDa_00009     | 02/12/21 |           | Wellington Laboratories, Lot MPFUDa0216 |                      | (Purchased Reagent) |              | 13C2 PFUnA                                         | 50 ug/mL      |
| .LCPFC2SP_00026      | 07/30/17 | 01/30/17  | Methanol, Lot 104453                    | 10000 uL             | LC6:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.474 ug/mL   |
|                      |          |           |                                         |                      | LC8:2FTS_00002      | 100 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.479 ug/mL   |
|                      |          |           |                                         |                      | LCN-EtFOSA-M_00003  | 100 uL       | N-ethylperfluoro-1-octanesulfo namide              | 0.5 ug/mL     |
|                      |          |           |                                         |                      | LCN-EtFOSAA_00002   | 100 uL       | N-ethyl perfluorooctane sulfonamidoacetic acid     | 0.5 ug/mL     |
|                      |          |           |                                         |                      | LCN-MeFOSA-M_00002  | 100 uL       | MeFOSA                                             | 0.5 ug/mL     |
|                      |          |           |                                         |                      | LCN-MeFOSAA_00003   | 100 uL       | N-methyl perfluorooctane sulfonamidoacetic acid    | 0.5 ug/mL     |
| ..LC6:2FTS_00002     | 06/25/21 |           | WELLINGTON, Lot 62FTS0616               |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ug/mL    |
| ..LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015               |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ug/mL    |
| ..LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NetFOSA0516M            |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfo namide              | 50 ug/mL      |
| ..LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NetFOSAA0116            |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 50 ug/mL      |
| ..LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M            |                      | (Purchased Reagent) |              | MeFOSA                                             | 50 ug/mL      |
| ..LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116            |                      | (Purchased Reagent) |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 50 ug/mL      |
| .LCPFCSP_00074       | 06/14/17 | 12/14/16  | Methanol, Lot 090285                    | 10000 uL             | LCPFBA_00005        | 200 uL       | Perfluorobutyric acid                              | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFBS_00005        | 200 uL       | Perfluorobutanesulfonic acid (PFBS)                | 0.884 ug/mL   |
|                      |          |           |                                         |                      | LCPFDA_00005        | 200 uL       | Perfluorodecanoic acid                             | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFDoA_00005       | 200 uL       | Perfluorododecanoic acid                           | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFDS_00006        | 200 uL       | Perfluorodecane Sulfonic acid                      | 0.964 ug/mL   |
|                      |          |           |                                         |                      | LCPFHpA_00006       | 200 uL       | Perfluoroheptanoic acid                            | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFHpS_00009       | 200 uL       | Perfluoroheptanesulfonic Acid                      | 0.952 ug/mL   |
|                      |          |           |                                         |                      | LCPFHxA_00005       | 200 uL       | Perfluorohexanoic acid                             | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFHxDA_00006      | 200 uL       | Perfluorohexadecanoic acid                         | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFHXS-br_00002    | 200 uL       | Perfluorohexanesulfonic acid                       | 0.91 ug/mL    |
|                      |          |           |                                         |                      | LCPFNA_00006        | 200 uL       | Perfluorononanoic acid                             | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFOA_00006        | 200 uL       | Perfluorooctanoic acid (PFOA)                      | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFODA_00006       | 200 uL       | Perfluorooctadecanoic acid                         | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFOS-br_00002     | 200 uL       | Perfluorooctanesulfonic acid (PFOS)                | 0.928 ug/mL   |
|                      |          |           |                                         |                      | LCPFOSA_00008       | 200 uL       | Perfluorooctane Sulfonamide                        | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFPeA_00005       | 200 uL       | Perfluoropentanoic acid                            | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFTeDA_00005      | 200 uL       | Perfluorotetradecanoic acid                        | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFTrDA_00005      | 200 uL       | Perfluorotridecanoic acid                          | 1 ug/mL       |
|                      |          |           |                                         |                      | LCPFUdA_00005       | 200 uL       | Perfluoroundecanoic acid                           | 1 ug/mL       |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID                 | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                                               | Concentration |
|----------------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|-------------------------------------------------------|---------------|
|                            |          |           |                                           |                      | Reagent ID          | Volume Added |                                                       |               |
| ..LCPFBA 00005             | 05/27/21 |           | Wellington Laboratories, Lot PFBA0516     |                      | (Purchased Reagent) |              | Perfluorobutyric acid                                 | 50 ug/mL      |
| ..LCPFBS_00005             | 03/15/21 |           | Wellington Laboratories, Lot LPFBS0316    |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS)                   | 44.2 ug/mL    |
| ..LCPFDA 00005             | 07/02/20 |           | Wellington Laboratories, Lot PFDA0615     |                      | (Purchased Reagent) |              | Perfluorodecanoic acid                                | 50 ug/mL      |
| ..LCPFDoA 00005            | 01/30/20 |           | Wellington Laboratories, Lot PFDoA0115    |                      | (Purchased Reagent) |              | Perfluorododecanoic acid                              | 50 ug/mL      |
| ..LCPFDS 00006             | 05/24/21 |           | Wellington Laboratories, Lot LPFDS0516    |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonic acid                         | 48.2 ug/mL    |
| ..LCPFHpA 00006            | 01/22/21 |           | Wellington Laboratories, Lot PFHpA0116    |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid                               | 50 ug/mL      |
| ..LCPFHpS 00009            | 11/06/20 |           | Wellington Laboratories, Lot LPFHpS1115   |                      | (Purchased Reagent) |              | Perfluoroheptanesulfonic Acid                         | 47.6 ug/mL    |
| ..LCPFHxA 00005            | 12/22/20 |           | Wellington Laboratories, Lot PFHxA1215    |                      | (Purchased Reagent) |              | Perfluorohexanoic acid                                | 50 ug/mL      |
| ..LCPFHxDA 00006           | 05/25/21 |           | Wellington Laboratories, Lot PFHxDA0516   |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid                            | 50 ug/mL      |
| ..LCPFHxS-br 00002         | 07/03/20 |           | Wellington Laboratories, Lot brPFHxSK0615 |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid                          | 45.5 ug/mL    |
| ..LCPFNA 00006             | 10/23/20 |           | Wellington Laboratories, Lot PFNA1015     |                      | (Purchased Reagent) |              | Perfluorononanoic acid                                | 50 ug/mL      |
| ..LCPFOA 00006             | 11/06/20 |           | Wellington Laboratories, Lot PFOA1115     |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)                         | 50 ug/mL      |
| ..LCPFODA 00006            | 04/29/21 |           | Wellington Laboratories, Lot PFODA0416    |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid                            | 50 ug/mL      |
| ..LCPFOS-br_00002          | 10/14/20 |           | Wellington Laboratories, Lot brPFOSK1015  |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS)                   | 46.4 ug/mL    |
| ..LCPFOSA 00008            | 09/02/17 |           | Wellington Laboratories, Lot FOSA0815I    |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide                           | 50 ug/mL      |
| ..LCPFPeA 00005            | 01/30/20 |           | Wellington Laboratories, Lot PFPeA0115    |                      | (Purchased Reagent) |              | Perfluoropentanoic acid                               | 50 ug/mL      |
| ..LCPFTeDA 00005           | 12/09/20 |           | Wellington Laboratories, Lot PFTeDA1215   |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid                           | 50 ug/mL      |
| ..LCPFTrDA 00005           | 02/12/21 |           | Wellington Laboratories, Lot PFTrDA0216   |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid                             | 50 ug/mL      |
| ..LCPFUdA 00005            | 08/19/20 |           | Wellington Laboratories, Lot PFUdA0815    |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid                              | 50 ug/mL      |
| <b>LCPFC_FULL-L6_00002</b> | 06/14/17 | 02/24/17  | MeOH/H2O, Lot 090285                      | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                                          | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | d-N-MeFOSA-M                                          | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | d3-NMeFOSAA                                           | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | d5-NETFOSAA                                           | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | M2-6:2FTS                                             | 47.5 ng/mL    |
|                            |          |           |                                           |                      |                     |              | M2-8:2FTS                                             | 47.9 ng/mL    |
|                            |          |           |                                           |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                                           | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C2-PFTeDA                                           | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C4-PFHpA                                            | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C5-PFPeA                                            | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C8 FOSA                                             | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C4 PFBA                                             | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C2 PFDA                                             | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C2 PFDoA                                            | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C2 PFHxA                                            | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 18O2 PFHxS                                            | 47.3 ng/mL    |
|                            |          |           |                                           |                      |                     |              | 13C5 PFNA                                             | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C4 PFOA                                             | 50 ng/mL      |
|                            |          |           |                                           |                      |                     |              | 13C4 PFOS                                             | 47.8 ng/mL    |
|                            |          |           |                                           |                      |                     |              | 13C2 PFUnA                                            | 50 ng/mL      |
|                            |          |           |                                           |                      | LCMPFC2SP_00027     | 1000 uL      | Sodium 1H, 1H, 2H, 2H-perfluorooctane sulfonate (6:2) | 189.6 ng/mL   |
|                            |          |           |                                           |                      |                     |              | Sodium 1H, 1H, 2H, 2H-perfluorooctane sulfonate (8:2) | 191.6 ng/mL   |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                  | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|-----------------------|----------|-----------|--------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                       |          |           |                                |                      | Reagent ID          | Volume Added |                                                    |               |
|                       |          |           |                                |                      |                     |              | N-ethylperfluoro-1-octanesulfo<br>namide           | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | N-ethyl perfluorooctane<br>sulfonamidoacetic acid  | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | MeFOSA                                             | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | N-methyl perfluorooctane<br>sulfonamidoacetic acid | 200 ng/mL     |
|                       |          |           |                                |                      | LCPFCSP_00080       | 2000 uL      | Perfluorobutyric acid                              | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorobutanesulfonic acid<br>(PFBS)             | 176.8 ng/mL   |
|                       |          |           |                                |                      |                     |              | Perfluorodecanoic acid                             | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorododecanoic acid                           | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorodecane Sulfonic acid                      | 192.8 ng/mL   |
|                       |          |           |                                |                      |                     |              | Perfluoroheptanoic acid                            | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluoroheptanesulfonic Acid                      | 190.4 ng/mL   |
|                       |          |           |                                |                      |                     |              | Perfluorohexanoic acid                             | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorohexadecanoic acid                         | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorohexanesulfonic acid                       | 182 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorononanoic acid                             | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorooctanoic acid (PFOA)                      | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorooctadecanoic acid                         | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorooctanesulfonic acid<br>(PFOS)             | 185.6 ng/mL   |
|                       |          |           |                                |                      |                     |              | Perfluorooctane Sulfonamide                        | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluoropentanoic acid                            | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorotetradecanoic acid                        | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluorotridecanoic acid                          | 200 ng/mL     |
|                       |          |           |                                |                      |                     |              | Perfluoroundecanoic acid                           | 200 ng/mL     |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17  | Methanol, Lot 104453           | 50000 uL             | LCd-NEtFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                                |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                                       | 1 ug/mL       |
|                       |          |           |                                |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                                        | 1 ug/mL       |
|                       |          |           |                                |                      | LCd5-NEtFOSAA 00003 | 1000 uL      | d5-NEtFOSAA                                        | 1 ug/mL       |
|                       |          |           |                                |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                                          | 0.95 ug/mL    |
|                       |          |           |                                |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                                          | 0.958 ug/mL   |
| ..LCd-NEtFOSA-M 00004 | 06/10/21 |           | WELLINGTON, Lot dNetFOSA0616M  |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                                       | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 |           | WELLINGTON, Lot dNMeFOSA0616M  |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                                       | 50 ug/mL      |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 |           | WELLINGTON, Lot d3NMeFOSAA0516 |                      | (Purchased Reagent) |              | d3-NMeFOSAA                                        | 50 ug/mL      |
| ..LCd5-NEtFOSAA 00003 | 08/02/21 |           | WELLINGTON, Lot d5NEtFOSAA0716 |                      | (Purchased Reagent) |              | d5-NEtFOSAA                                        | 50 ug/mL      |
| ..LCM2-6:FTS 00003    | 01/08/21 |           | WELLINGTON, Lot M262FTS0116    |                      | (Purchased Reagent) |              | M2-6:2FTS                                          | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003   | 01/08/21 |           | WELLINGTON, Lot M282FTS0116    |                      | (Purchased Reagent) |              | M2-8:2FTS                                          | 47.9 ug/mL    |
| .LCMPFCSU_00047       | 06/14/17 | 12/14/16  | Methanol, Lot Baker<br>144541  | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                                        | 1 ug/mL       |
|                       |          |           |                                |                      | LCM2PFTeDA 00007    | 1000 uL      | 13C2-PFTeDA                                        | 1 ug/mL       |
|                       |          |           |                                |                      | LCM4PFHPA 00007     | 1000 uL      | 13C4-PFHPa                                         | 1 ug/mL       |
|                       |          |           |                                |                      | LCM5PFPEA 00008     | 1000 uL      | 13C5-PFPeA                                         | 1 ug/mL       |
|                       |          |           |                                |                      | LCM8FOSA 00011      | 1000 uL      | 13C8 FOSA                                          | 1 ug/mL       |
|                       |          |           |                                |                      | LCMPFBA 00008       | 1000 uL      | 13C4 PFBA                                          | 1 ug/mL       |
|                       |          |           |                                |                      | LCMPFDA 00011       | 1000 uL      | 13C2 PFDA                                          | 1 ug/mL       |
|                       |          |           |                                |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDaA                                         | 1 ug/mL       |



## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                                            | Concentration |
|----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|----------------------------------------------------|---------------|
|                      |          |           |                                           |                      | Reagent ID          | Volume Added |                                                    |               |
|                      |          |           |                                           |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                                         | 1 ug/mL       |
|                      |          |           |                                           |                      | LCMPFHxS_00008      | 1000 uL      | 1802 PFHxS                                         | 0.946 ug/mL   |
|                      |          |           |                                           |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                                          | 1 ug/mL       |
|                      |          |           |                                           |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                                          | 1 ug/mL       |
|                      |          |           |                                           |                      | LCMPFOS_00017       | 1000 uL      | 13C4 PFOS                                          | 0.956 ug/mL   |
|                      |          |           |                                           |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                                         | 1 ug/mL       |
| ..LCM2PFHxDA_00008   | 01/07/21 |           | Wellington Laboratories, Lot M2PFHxDA1112 |                      | (Purchased Reagent) |              | 13C2-PFHxDA                                        | 50 ug/mL      |
| ..LCM2PFTeDA_00007   | 12/07/20 |           | Wellington Laboratories, Lot M2PFTeDA1115 |                      | (Purchased Reagent) |              | 13C2-PFTeDA                                        | 50 ug/mL      |
| ..LCM4PFHPA_00007    | 05/27/21 |           | Wellington Laboratories, Lot M4PFHpA0516  |                      | (Purchased Reagent) |              | 13C4-PFHpA                                         | 50 ug/mL      |
| ..LCM5PFPEA_00008    | 05/22/20 |           | Wellington Laboratories, Lot M5PFPeA0515  |                      | (Purchased Reagent) |              | 13C5-PFPeA                                         | 50 ug/mL      |
| ..LCM8FOSA_00011     | 12/22/17 |           | Wellington Laboratories, Lot M8FOSA1215I  |                      | (Purchased Reagent) |              | 13C8 FOSA                                          | 50 ug/mL      |
| ..LCMPFBA_00008      | 05/24/21 |           | Wellington Laboratories, Lot MPFBA0516    |                      | (Purchased Reagent) |              | 13C4 PFBA                                          | 50 ug/mL      |
| ..LCMPFDA_00011      | 08/19/20 |           | Wellington Laboratories, Lot MPFDA0815    |                      | (Purchased Reagent) |              | 13C2 PFDA                                          | 50 ug/mL      |
| ..LCMPFDoA_00008     | 04/08/21 |           | Wellington Laboratories, Lot MPFDoA0416   |                      | (Purchased Reagent) |              | 13C2 PFDoA                                         | 50 ug/mL      |
| ..LCMPFHxA_00012     | 04/08/21 |           | Wellington Laboratories, Lot MPFHxA0416   |                      | (Purchased Reagent) |              | 13C2 PFHxA                                         | 50 ug/mL      |
| ..LCMPFHxS_00008     | 10/23/20 |           | Wellington Laboratories, Lot MPFHxS1015   |                      | (Purchased Reagent) |              | 1802 PFHxS                                         | 47.3 ug/mL    |
| ..LCMPFNA_00008      | 04/13/19 |           | Wellington Laboratories, Lot MPFNA0414    |                      | (Purchased Reagent) |              | 13C5 PFNA                                          | 50 ug/mL      |
| ..LCMPFOA_00012      | 01/22/21 |           | Wellington Laboratories, Lot MPFOA0116    |                      | (Purchased Reagent) |              | 13C4 PFOA                                          | 50 ug/mL      |
| ..LCMPFOS_00017      | 08/03/21 |           | Wellington Laboratories, Lot MPFOS0816    |                      | (Purchased Reagent) |              | 13C4 PFOS                                          | 47.8 ug/mL    |
| ..LCMPFUDa_00009     | 02/12/21 |           | Wellington Laboratories, Lot MPFUDa0216   |                      | (Purchased Reagent) |              | 13C2 PFUnA                                         | 50 ug/mL      |
| ..LCPFC2SP_00027     | 08/24/17 | 02/24/17  | Methanol, Lot 104453                      | 10000 uL             | LC6:2FTS_00002      | 200 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 0.948 ug/mL   |
|                      |          |           |                                           |                      | LC8:2FTS_00002      | 200 uL       | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 0.958 ug/mL   |
|                      |          |           |                                           |                      | LCN-EtFOSA-M_00003  | 200 uL       | N-ethylperfluoro-1-octanesulfoamide                | 1 ug/mL       |
|                      |          |           |                                           |                      | LCN-EtFOSAA_00002   | 200 uL       | N-ethyl perfluorooctane sulfonamidoacetic acid     | 1 ug/mL       |
|                      |          |           |                                           |                      | LCN-MeFOSA-M_00002  | 200 uL       | MeFOSA                                             | 1 ug/mL       |
|                      |          |           |                                           |                      | LCN-MeFOSAA_00003   | 200 uL       | N-methyl perfluorooctane sulfonamidoacetic acid    | 1 ug/mL       |
| ..LC6:2FTS_00002     | 06/25/21 |           | WELLINGTON, Lot 62FTS0616                 |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (6:2) | 47.4 ug/mL    |
| ..LC8:2FTS_00002     | 10/23/20 |           | WELLINGTON, Lot 82FTS1015                 |                      | (Purchased Reagent) |              | Sodium 1H,1H,2H,2H-perfluorooctane sulfonate (8:2) | 47.9 ug/mL    |
| ..LCN-EtFOSA-M_00003 | 05/24/21 |           | WELLINGTON, Lot NETFOSA0516M              |                      | (Purchased Reagent) |              | N-ethylperfluoro-1-octanesulfoamide                | 50 ug/mL      |
| ..LCN-EtFOSAA_00002  | 01/20/21 |           | WELLINGTON, Lot NETFOSAA0116              |                      | (Purchased Reagent) |              | N-ethyl perfluorooctane sulfonamidoacetic acid     | 50 ug/mL      |
| ..LCN-MeFOSA-M_00002 | 05/24/21 |           | WELLINGTON, Lot NMeFOSA0714M              |                      | (Purchased Reagent) |              | MeFOSA                                             | 50 ug/mL      |
| ..LCN-MeFOSAA_00003  | 01/20/21 |           | WELLINGTON, Lot NMeFOSAA0116              |                      | (Purchased Reagent) |              | N-methyl perfluorooctane sulfonamidoacetic acid    | 50 ug/mL      |
| ..LCPFCSP_00080      | 08/01/17 | 02/01/17  | Methanol, Lot 090285                      | 10000 uL             | LCPFBA_00005        | 100 uL       | Perfluorobutyric acid                              | 0.5 ug/mL     |
|                      |          |           |                                           |                      | LCPFBS_00005        | 100 uL       | Perfluorobutanesulfonic acid (PFBS)                | 0.442 ug/mL   |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID         | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|--------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                    |          |           |                                           |                      | Reagent ID          | Volume Added |                                     |               |
|                    |          |           |                                           |                      | LCPFDA_00005        | 100 uL       | Perfluorodecanoic acid              | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFDoA_00005       | 100 uL       | Perfluorododecanoic acid            | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFDS_00006        | 100 uL       | Perfluorodecane Sulfonic acid       | 0.482 ug/mL   |
|                    |          |           |                                           |                      | LCPFHpA_00006       | 100 uL       | Perfluoroheptanoic acid             | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFHpS_00009       | 100 uL       | Perfluoroheptanesulfonic Acid       | 0.476 ug/mL   |
|                    |          |           |                                           |                      | LCPFHxA_00005       | 100 uL       | Perfluorohexanoic acid              | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFHxDA_00006      | 100 uL       | Perfluorohexadecanoic acid          | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFHxS-br_00002    | 100 uL       | Perfluorohexanesulfonic acid        | 0.455 ug/mL   |
|                    |          |           |                                           |                      | LCPFNA_00006        | 100 uL       | Perfluorononanoic acid              | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFOA_00006        | 100 uL       | Perfluorooctanoic acid (PFOA)       | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFODA_00006       | 100 uL       | Perfluorooctadecanoic acid          | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFOS-br_00002     | 100 uL       | Perfluorooctanesulfonic acid (PFOS) | 0.464 ug/mL   |
|                    |          |           |                                           |                      | LCPFOSA_00008       | 100 uL       | Perfluorooctane Sulfonamide         | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFPeA_00005       | 100 uL       | Perfluoropentanoic acid             | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFTeDA_00005      | 100 uL       | Perfluorotetradecanoic acid         | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFTrDA_00005      | 100 uL       | Perfluorotridecanoic acid           | 0.5 ug/mL     |
|                    |          |           |                                           |                      | LCPFUDA_00005       | 100 uL       | Perfluoroundecanoic acid            | 0.5 ug/mL     |
| ..LCPFBA_00005     | 05/27/21 |           | Wellington Laboratories, Lot PFBA0516     |                      | (Purchased Reagent) |              | Perfluorobutyric acid               | 50 ug/mL      |
| ..LCPFBS_00005     | 03/15/21 |           | Wellington Laboratories, Lot LPFBS0316    |                      | (Purchased Reagent) |              | Perfluorobutanesulfonic acid (PFBS) | 44.2 ug/mL    |
| ..LCPFDA_00005     | 07/02/20 |           | Wellington Laboratories, Lot PFDA0615     |                      | (Purchased Reagent) |              | Perfluorodecanoic acid              | 50 ug/mL      |
| ..LCPFDoA_00005    | 01/30/20 |           | Wellington Laboratories, Lot PFDoA0115    |                      | (Purchased Reagent) |              | Perfluorododecanoic acid            | 50 ug/mL      |
| ..LCPFDS_00006     | 05/24/21 |           | Wellington Laboratories, Lot LPFDS0516    |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonic acid       | 48.2 ug/mL    |
| ..LCPFHpA_00006    | 01/22/21 |           | Wellington Laboratories, Lot PFHpA0116    |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid             | 50 ug/mL      |
| ..LCPFHpS_00009    | 11/06/20 |           | Wellington Laboratories, Lot LPFHpS1115   |                      | (Purchased Reagent) |              | Perfluoroheptanesulfonic Acid       | 47.6 ug/mL    |
| ..LCPFHxA_00005    | 12/22/20 |           | Wellington Laboratories, Lot PFHxA1215    |                      | (Purchased Reagent) |              | Perfluorohexanoic acid              | 50 ug/mL      |
| ..LCPFHxDA_00006   | 05/25/21 |           | Wellington Laboratories, Lot PFHxDA0516   |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid          | 50 ug/mL      |
| ..LCPFHxS-br_00002 | 07/03/20 |           | Wellington Laboratories, Lot brPFHxSK0615 |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid        | 45.5 ug/mL    |
| ..LCPFNA_00006     | 10/23/20 |           | Wellington Laboratories, Lot PFNA1015     |                      | (Purchased Reagent) |              | Perfluorononanoic acid              | 50 ug/mL      |
| ..LCPFOA_00006     | 11/06/20 |           | Wellington Laboratories, Lot PFOA1115     |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)       | 50 ug/mL      |
| ..LCPFODA_00006    | 04/29/21 |           | Wellington Laboratories, Lot PFODA0416    |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid          | 50 ug/mL      |
| ..LCPFOS-br_00002  | 10/14/20 |           | Wellington Laboratories, Lot brPFOSK1015  |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 46.4 ug/mL    |
| ..LCPFOSA_00008    | 09/02/17 |           | Wellington Laboratories, Lot FOSA0815I    |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide         | 50 ug/mL      |
| ..LCPFPeA_00005    | 01/30/20 |           | Wellington Laboratories, Lot PFPeA0115    |                      | (Purchased Reagent) |              | Perfluoropentanoic acid             | 50 ug/mL      |
| ..LCPFTeDA_00005   | 12/09/20 |           | Wellington Laboratories, Lot PFTeDA1215   |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid         | 50 ug/mL      |
| ..LCPFTrDA_00005   | 02/12/21 |           | Wellington Laboratories, Lot PFTrDA0216   |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid           | 50 ug/mL      |
| ..LCPFUDA_00005    | 08/19/20 |           | Wellington Laboratories, Lot PFUDA0815    |                      | (Purchased Reagent) |              | Perfluoroundecanoic acid            | 50 ug/mL      |
| LCPFCIC_FULL_00001 | 06/01/17 | 02/16/17  | MeOH/H2O, Lot 09285                       | 5 mL                 | LCMPFC2SU_00014     | 250 uL       | d-N-EtFOSA-M                        | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | d-N-MeFOSA-M                        | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | d3-NMeFOSAA                         | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | d5-NETFOSAA                         | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | M2-6:2FTS                           | 47.5 ng/mL    |
|                    |          |           |                                           |                      |                     |              | M2-8:2FTS                           | 47.9 ng/mL    |
|                    |          |           |                                           |                      | LCMPFCSU_00047      | 250 uL       | 13C2-PFHxDA                         | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | 13C2-PFTeDA                         | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              | 13C4-PFHpA                          | 50 ng/mL      |
|                    |          |           |                                           |                      |                     |              |                                     |               |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID            | Exp Date | Prep Date | Dilutant Used                             | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|-----------------------|----------|-----------|-------------------------------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                       |          |           |                                           |                      | Reagent ID          | Volume Added |                                     |               |
|                       |          |           |                                           |                      |                     |              | 13C5-PFPeA                          | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C8 FOSA                           | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C4 PFBA                           | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C2 PFDA                           | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C2 PFDoA                          | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C2 PFHxA                          | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 18O2 PFHxS                          | 47.3 ng/mL    |
|                       |          |           |                                           |                      |                     |              | 13C5 PFNA                           | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C4 PFOA                           | 50 ng/mL      |
|                       |          |           |                                           |                      |                     |              | 13C4 PFOS                           | 47.8 ng/mL    |
|                       |          |           |                                           |                      |                     |              | 13C2 PFUnA                          | 50 ng/mL      |
|                       |          |           |                                           |                      | LCPFACMXB_00007     | 125 uL       | Perfluorooctanesulfonic acid (PFOS) | 47.75 ng/mL   |
| .LCMPFC2SU_00014      | 08/13/17 | 02/13/17  | Methanol, Lot 104453                      | 50000 uL             | LCd-NETFOSA-M 00004 | 1000 uL      | d-N-EtFOSA-M                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd-NMeFOSA-M 00003 | 1000 uL      | d-N-MeFOSA-M                        | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd3-NMeFOSAA 00003 | 1000 uL      | d3-NMeFOSAA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCd5-NETFOSAA 00003 | 1000 uL      | d5-NETFOSAA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM2-6:FTS 00003    | 1000 uL      | M2-6:2FTS                           | 0.95 ug/mL    |
|                       |          |           |                                           |                      | LCM2-8:2FTS 00003   | 1000 uL      | M2-8:2FTS                           | 0.958 ug/mL   |
| ..LCd-NETFOSA-M 00004 | 06/10/21 |           | WELLINGTON, Lot dNetFOSA0616M             |                      | (Purchased Reagent) |              | d-N-EtFOSA-M                        | 50 ug/mL      |
| ..LCd-NMeFOSA-M 00003 | 06/10/21 |           | WELLINGTON, Lot dNMeFOSA0616M             |                      | (Purchased Reagent) |              | d-N-MeFOSA-M                        | 50 ug/mL      |
| ..LCd3-NMeFOSAA 00003 | 05/31/21 |           | WELLINGTON, Lot d3NMeFOSAA0516            |                      | (Purchased Reagent) |              | d3-NMeFOSAA                         | 50 ug/mL      |
| ..LCd5-NETFOSAA 00003 | 08/02/21 |           | WELLINGTON, Lot d5NetFOSAA0716            |                      | (Purchased Reagent) |              | d5-NETFOSAA                         | 50 ug/mL      |
| ..LCM2-6:FTS 00003    | 01/08/21 |           | WELLINGTON, Lot M262FTS0116               |                      | (Purchased Reagent) |              | M2-6:2FTS                           | 47.5 ug/mL    |
| ..LCM2-8:2FTS 00003   | 01/08/21 |           | WELLINGTON, Lot M282FTS0116               |                      | (Purchased Reagent) |              | M2-8:2FTS                           | 47.9 ug/mL    |
| .LCMPFCSU_00047       | 06/14/17 | 12/14/16  | Methanol, Lot Baker 144541                | 50000 uL             | LCM2PFHxDA_00008    | 1000 uL      | 13C2-PFHxDA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM2PFTeDA_00007    | 1000 uL      | 13C2-PFTeDA                         | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM4PFHPA_00007     | 1000 uL      | 13C4-PFHpa                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM5PFPEA_00008     | 1000 uL      | 13C5-PFPeA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCM8FOSA_00011      | 1000 uL      | 13C8 FOSA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFBA_00008       | 1000 uL      | 13C4 PFBA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDA_00011       | 1000 uL      | 13C2 PFDA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFDoA_00008      | 1000 uL      | 13C2 PFDoA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxA_00012      | 1000 uL      | 13C2 PFHxA                          | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFHxS_00008      | 1000 uL      | 18O2 PFHxS                          | 0.946 ug/mL   |
|                       |          |           |                                           |                      | LCMPFNA_00008       | 1000 uL      | 13C5 PFNA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOA_00012       | 1000 uL      | 13C4 PFOA                           | 1 ug/mL       |
|                       |          |           |                                           |                      | LCMPFOS_00017       | 1000 uL      | 13C4 PFOS                           | 0.956 ug/mL   |
|                       |          |           |                                           |                      | LCMPFUDa_00009      | 1000 uL      | 13C2 PFUnA                          | 1 ug/mL       |
| ..LCM2PFHxDA_00008    | 01/07/21 |           | Wellington Laboratories, Lot M2PFHxDA1112 |                      | (Purchased Reagent) |              | 13C2-PFHxDA                         | 50 ug/mL      |
| ..LCM2PFTeDA_00007    | 12/07/20 |           | Wellington Laboratories, Lot M2PFTeDA1115 |                      | (Purchased Reagent) |              | 13C2-PFTeDA                         | 50 ug/mL      |
| ..LCM4PFHPA_00007     | 05/27/21 |           | Wellington Laboratories, Lot M4PFHpA0516  |                      | (Purchased Reagent) |              | 13C4-PFHpa                          | 50 ug/mL      |
| ..LCM5PFPEA_00008     | 05/22/20 |           | Wellington Laboratories, Lot M5PFPeA0515  |                      | (Purchased Reagent) |              | 13C5-PFPeA                          | 50 ug/mL      |
| ..LCM8FOSA_00011      | 12/22/17 |           | Wellington Laboratories, Lot M8FOSA1215I  |                      | (Purchased Reagent) |              | 13C8 FOSA                           | 50 ug/mL      |
| ..LCMPFBA_00008       | 05/24/21 |           | Wellington Laboratories, Lot MPFBA0516    |                      | (Purchased Reagent) |              | 13C4 PFBA                           | 50 ug/mL      |
| ..LCMPFDA_00011       | 08/19/20 |           | Wellington Laboratories, Lot MPFDA0815    |                      | (Purchased Reagent) |              | 13C2 PFDA                           | 50 ug/mL      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date                                | Dilutant Used        | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|----------------------|----------|------------------------------------------|----------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                      |          |                                          |                      |                      | Reagent ID          | Volume Added |                                     |               |
| ..LCMPFDoA_00008     | 04/08/21 | Wellington Laboratories, Lot MPFDoA0416  |                      |                      | (Purchased Reagent) |              | 13C2 PFDoA                          | 50 ug/mL      |
| ..LCMPFHxA_00012     | 04/08/21 | Wellington Laboratories, Lot MPFHxA0416  |                      |                      | (Purchased Reagent) |              | 13C2 PFHxA                          | 50 ug/mL      |
| ..LCMPFHxS_00008     | 10/23/20 | Wellington Laboratories, Lot MPFHxS1015  |                      |                      | (Purchased Reagent) |              | 18O2 PFHxS                          | 47.3 ug/mL    |
| ..LCMPFNA_00008      | 04/13/19 | Wellington Laboratories, Lot MPFNA0414   |                      |                      | (Purchased Reagent) |              | 13C5 PFNA                           | 50 ug/mL      |
| ..LCMPFOA_00012      | 01/22/21 | Wellington Laboratories, Lot MPFOA0116   |                      |                      | (Purchased Reagent) |              | 13C4 PFOA                           | 50 ug/mL      |
| ..LCMPFOS_00017      | 08/03/21 | Wellington Laboratories, Lot MPFOS0816   |                      |                      | (Purchased Reagent) |              | 13C4 PFOS                           | 47.8 ug/mL    |
| ..LCMPFUDa_00009     | 02/12/21 | Wellington Laboratories, Lot MPFUDa0216  |                      |                      | (Purchased Reagent) |              | 13C2 PFUnA                          | 50 ug/mL      |
| .LCPFACMXB_00007     | 11/06/20 | Wellington Laboratories, Lot PFACMXB1115 |                      |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 1.91 ug/mL    |
|                      |          |                                          |                      |                      |                     |              | Perfluorooctanoic acid (PFOA)       | 2 ug/mL       |
| <b>LCPFCSP_00080</b> | 08/01/17 | 02/01/17                                 | Methanol, Lot 090285 | 10000 uL             | LCPFBA_00005        | 100 uL       | Perfluorobutyric acid               | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFBS_00005        | 100 uL       | Perfluorobutane Sulfonate           | 0.442 ug/mL   |
|                      |          |                                          |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS) | 0.442 ug/mL   |
|                      |          |                                          |                      |                      | LCPFDA_00005        | 100 uL       | Perfluorodecanoic acid              | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFDoA_00005       | 100 uL       | Perfluorododecanoic acid            | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFDS_00006        | 100 uL       | Perfluorodecane Sulfonate           | 0.482 ug/mL   |
|                      |          |                                          |                      |                      |                     |              | Perfluorodecane Sulfonic acid       | 0.482 ug/mL   |
|                      |          |                                          |                      |                      | LCPFHpA_00006       | 100 uL       | Perfluoroheptanoic acid             | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFHpS_00009       | 100 uL       | Perfluoroheptane Sulfonate          | 0.476 ug/mL   |
|                      |          |                                          |                      |                      |                     |              | Perfluoroheptanesulfonic Acid       | 0.476 ug/mL   |
|                      |          |                                          |                      |                      | LCPFHxA_00005       | 100 uL       | Perfluorohexanoic acid              | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFHxDA_00006      | 100 uL       | Perfluorohexadecanoic acid          | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFHxS-br_00002    | 100 uL       | Perfluorohexane Sulfonate           | 0.455 ug/mL   |
|                      |          |                                          |                      |                      |                     |              | Perfluorohexanesulfonic acid        | 0.455 ug/mL   |
|                      |          |                                          |                      |                      | LCPFNA_00006        | 100 uL       | Perfluorononanoic acid              | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFOA_00006        | 100 uL       | Perfluorooctanoic acid (PFOA)       | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFODA_00006       | 100 uL       | Perfluorooctadecanoic acid          | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFOS-br_00002     | 100 uL       | Perfluorooctanesulfonic acid (PFOS) | 0.464 ug/mL   |
|                      |          |                                          |                      |                      | LCPFOSA_00008       | 100 uL       | Perfluorooctane Sulfonamide         | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFPeA_00005       | 100 uL       | Perfluoropentanoic acid             | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFTeDA_00005      | 100 uL       | Perfluorotetradecanoic acid         | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFTrDA_00005      | 100 uL       | Perfluorotridecanoic acid           | 0.5 ug/mL     |
|                      |          |                                          |                      |                      | LCPFUdA_00005       | 100 uL       | Perfluoroundecanoic acid            | 0.5 ug/mL     |
| .LCPFBA_00005        | 05/27/21 | Wellington Laboratories, Lot PFBA0516    |                      |                      | (Purchased Reagent) |              | Perfluorobutyric acid               | 50 ug/mL      |
| .LCPFBS_00005        | 03/15/21 | Wellington Laboratories, Lot LPFBS0316   |                      |                      | (Purchased Reagent) |              | Perfluorobutane Sulfonate           | 44.2 ug/mL    |
|                      |          |                                          |                      |                      |                     |              | Perfluorobutanesulfonic acid (PFBS) | 44.2 ug/mL    |
| .LCPFDA_00005        | 07/02/20 | Wellington Laboratories, Lot PFDA0615    |                      |                      | (Purchased Reagent) |              | Perfluorodecanoic acid              | 50 ug/mL      |
| .LCPFDoA_00005       | 01/30/20 | Wellington Laboratories, Lot PFDoA0115   |                      |                      | (Purchased Reagent) |              | Perfluorododecanoic acid            | 50 ug/mL      |
| .LCPFDS_00006        | 05/24/21 | Wellington Laboratories, Lot LPFDS0516   |                      |                      | (Purchased Reagent) |              | Perfluorodecane Sulfonate           | 48.2 ug/mL    |
|                      |          |                                          |                      |                      |                     |              | Perfluorodecane Sulfonic acid       | 48.2 ug/mL    |
| .LCPFHpA_00006       | 01/22/21 | Wellington Laboratories, Lot PFHpA0116   |                      |                      | (Purchased Reagent) |              | Perfluoroheptanoic acid             | 50 ug/mL      |
| .LCPFHpS_00009       | 11/06/20 | Wellington Laboratories, Lot LPFHpS1115  |                      |                      | (Purchased Reagent) |              | Perfluoroheptane Sulfonate          | 47.6 ug/mL    |
|                      |          |                                          |                      |                      |                     |              | Perfluoroheptanesulfonic Acid       | 47.6 ug/mL    |
| .LCPFHxA_00005       | 12/22/20 | Wellington Laboratories, Lot PFHxA1215   |                      |                      | (Purchased Reagent) |              | Perfluorohexanoic acid              | 50 ug/mL      |
| .LCPFHxDA_00006      | 05/25/21 | Wellington Laboratories, Lot PFHxDA0516  |                      |                      | (Purchased Reagent) |              | Perfluorohexadecanoic acid          | 50 ug/mL      |

# REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID        | Exp Date | Prep Date                                 | Dilutant Used         | Reagent Final Volume | Parent Reagent      |              | Analyte                             | Concentration |
|-------------------|----------|-------------------------------------------|-----------------------|----------------------|---------------------|--------------|-------------------------------------|---------------|
|                   |          |                                           |                       |                      | Reagent ID          | Volume Added |                                     |               |
| .LCPFHxS-br_00002 | 07/03/20 | Wellington Laboratories, Lot brPFHxSK0615 |                       |                      | (Purchased Reagent) |              | Perfluorohexane Sulfonate           | 45.5 ug/mL    |
| .LCPFNA 00006     | 10/23/20 | Wellington Laboratories, Lot PFNA1015     |                       |                      | (Purchased Reagent) |              | Perfluorohexanesulfonic acid        | 45.5 ug/mL    |
| .LCPFOA 00006     | 11/06/20 | Wellington Laboratories, Lot PFOA1115     |                       |                      | (Purchased Reagent) |              | Perfluorononanoic acid              | 50 ug/mL      |
| .LCPFODA 00006    | 04/29/21 | Wellington Laboratories, Lot PFODA0416    |                       |                      | (Purchased Reagent) |              | Perfluorooctanoic acid (PFOA)       | 50 ug/mL      |
| .LCPFOS-br_00002  | 10/14/20 | Wellington Laboratories, Lot brPFOSK1015  |                       |                      | (Purchased Reagent) |              | Perfluorooctadecanoic acid          | 50 ug/mL      |
| .LCPFOSA 00008    | 09/02/17 | Wellington Laboratories, Lot FOSA0815I    |                       |                      | (Purchased Reagent) |              | Perfluorooctanesulfonic acid (PFOS) | 46.4 ug/mL    |
| .LCPFPeA 00005    | 01/30/20 | Wellington Laboratories, Lot PFPeA0115    |                       |                      | (Purchased Reagent) |              | Perfluorooctane Sulfonamide         | 50 ug/mL      |
| .LCPFTeDA 00005   | 12/09/20 | Wellington Laboratories, Lot PFTeDA1215   |                       |                      | (Purchased Reagent) |              | Perfluoropentanoic acid             | 50 ug/mL      |
| .LCPFTrDA 00005   | 02/12/21 | Wellington Laboratories, Lot PFTrDA0216   |                       |                      | (Purchased Reagent) |              | Perfluorotetradecanoic acid         | 50 ug/mL      |
| .LCPFUDa 00005    | 08/19/20 | Wellington Laboratories, Lot PFUDa0815    |                       |                      | (Purchased Reagent) |              | Perfluorotridecanoic acid           | 50 ug/mL      |
| MS14DICV_00004    | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4              | 10 ug/mL      |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4              | 2000 ug/mL    |
| MS14DICV_00004    | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS14DIC_00008       | 100 uL       | 1,4-Dioxane                         | 10 ug/mL      |
| .MS14DIC_00008    | 02/21/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 10 mL                | MS14DIC_00007       | 500 uL       | Nitrobenzene-d5                     | 10 ug/mL      |
| ..MS14DIC_00007   | 02/21/18 | Restek, Lot A0124653                      |                       |                      | MS8270SU_00100      | 200 uL       | 1,4-Dioxane                         | 100 ug/mL     |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 100 ug/mL     |
| ..MS14DIC_00007   | 02/21/18 | Restek, Lot A0124653                      |                       |                      | (Purchased Reagent) |              | 1,4-Dioxane                         | 2000 ug/mL    |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 5000 ug/mL    |
| MS14DL1_00011     | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS14DTA_00024       | 5 uL         | 1,4-Dioxane                         | 0.5 ug/mL     |
| .MS14DTA_00024    | 02/21/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 10 mL                | MS8270IS_00016      | 5 uL         | Nitrobenzene-d5                     | 0.5 ug/mL     |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | MS14DTA_00023       | 500 uL       | 1,4-Dichlorobenzene-d4              | 10 ug/mL      |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | MS8270SU_00100      | 200 uL       | 1,4-Dioxane                         | 100 ug/mL     |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 100 ug/mL     |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | (Purchased Reagent) |              | 1,4-Dioxane                         | 2000 ug/mL    |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 5000 ug/mL    |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4              | 2000 ug/mL    |
| MS14DL2_00010     | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS14DTA_00024       | 10 uL        | 1,4-Dioxane                         | 1 ug/mL       |
| .MS14DTA_00024    | 02/21/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 10 mL                | MS8270IS_00016      | 5 uL         | Nitrobenzene-d5                     | 1 ug/mL       |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | MS14DTA_00023       | 500 uL       | 1,4-Dichlorobenzene-d4              | 10 ug/mL      |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | MS8270SU_00100      | 200 uL       | 1,4-Dioxane                         | 100 ug/mL     |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 100 ug/mL     |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | (Purchased Reagent) |              | 1,4-Dioxane                         | 2000 ug/mL    |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 5000 ug/mL    |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4              | 2000 ug/mL    |
| MS14DL3_00010     | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS14DTA_00024       | 20 uL        | 1,4-Dioxane                         | 2 ug/mL       |
| .MS14DTA_00024    | 02/21/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 10 mL                | MS8270IS_00016      | 5 uL         | Nitrobenzene-d5                     | 2 ug/mL       |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | MS14DTA_00023       | 500 uL       | 1,4-Dichlorobenzene-d4              | 10 ug/mL      |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | MS8270SU_00100      | 200 uL       | 1,4-Dioxane                         | 100 ug/mL     |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 100 ug/mL     |
| ..MS14DTA_00023   | 02/21/18 | Restek, Lot A0121319                      |                       |                      | (Purchased Reagent) |              | 1,4-Dioxane                         | 2000 ug/mL    |
| ..MS8270SU_00100  | 02/21/18 | Restek, Lot A0103960                      |                       |                      | (Purchased Reagent) |              | Nitrobenzene-d5                     | 5000 ug/mL    |
| .MS8270IS_00016   | 01/12/18 | Restek, Lot A0120796                      |                       |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4              | 2000 ug/mL    |
| MS14DL4_00010     | 01/12/18 | 02/21/17                                  | MeCl2, Lot 0000152943 | 1 mL                 | MS14DTA_00024       | 50 uL        | 1,4-Dioxane                         | 5 ug/mL       |
|                   |          |                                           |                       |                      |                     |              | Nitrobenzene-d5                     | 5 ug/mL       |

REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

| Reagent ID           | Exp Date | Prep Date | Dilutant Used             | Reagent Final Volume | Parent Reagent      |              | Analyte                 | Concentration |
|----------------------|----------|-----------|---------------------------|----------------------|---------------------|--------------|-------------------------|---------------|
|                      |          |           |                           |                      | Reagent ID          | Volume Added |                         |               |
| .MS14DTA_00024       | 02/21/18 | 02/21/17  | MeCl2, Lot 0000152943     | 10 mL                | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4  | 10 ug/mL      |
|                      |          |           |                           |                      | MS14DTA_00023       | 500 uL       | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270SU_00100      | 200 uL       | Nitrobenzene-d5         | 100 ug/mL     |
| ..MS14DTA_00023      | 02/21/18 |           | Restek, Lot A0121319      |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| ..MS8270SU_00100     | 02/21/18 |           | Restek, Lot A0103960      |                      | (Purchased Reagent) |              | Nitrobenzene-d5         | 5000 ug/mL    |
| .MS8270IS_00016      | 01/12/18 |           | Restek, Lot A0120796      |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |
| <b>MS14DL5_00010</b> | 01/12/18 | 02/21/17  | MeCl2, Lot 0000152943     | 1 mL                 | MS14DTA_00024       | 100 uL       | 1,4-Dioxane             | 10 ug/mL      |
|                      |          |           |                           |                      |                     |              | Nitrobenzene-d5         | 10 ug/mL      |
|                      |          |           |                           |                      | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4  | 10 ug/mL      |
| .MS14DTA_00024       | 02/21/18 | 02/21/17  | MeCl2, Lot 0000152943     | 10 mL                | MS14DTA_00023       | 500 uL       | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270SU_00100      | 200 uL       | Nitrobenzene-d5         | 100 ug/mL     |
| ..MS14DTA_00023      | 02/21/18 |           | Restek, Lot A0121319      |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| ..MS8270SU_00100     | 02/21/18 |           | Restek, Lot A0103960      |                      | (Purchased Reagent) |              | Nitrobenzene-d5         | 5000 ug/mL    |
| .MS8270IS_00016      | 01/12/18 |           | Restek, Lot A0120796      |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |
| <b>MS14DL6_00010</b> | 01/12/18 | 02/21/17  | MeCl2, Lot 0000152943     | 1 mL                 | MS14DTA_00024       | 200 uL       | 1,4-Dioxane             | 20 ug/mL      |
|                      |          |           |                           |                      |                     |              | Nitrobenzene-d5         | 20 ug/mL      |
|                      |          |           |                           |                      | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4  | 10 ug/mL      |
| .MS14DTA_00024       | 02/21/18 | 02/21/17  | MeCl2, Lot 0000152943     | 10 mL                | MS14DTA_00023       | 500 uL       | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270SU_00100      | 200 uL       | Nitrobenzene-d5         | 100 ug/mL     |
| ..MS14DTA_00023      | 02/21/18 |           | Restek, Lot A0121319      |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| ..MS8270SU_00100     | 02/21/18 |           | Restek, Lot A0103960      |                      | (Purchased Reagent) |              | Nitrobenzene-d5         | 5000 ug/mL    |
| .MS8270IS_00016      | 01/12/18 |           | Restek, Lot A0120796      |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |
| <b>MS14DL7_00010</b> | 01/12/18 | 02/21/17  | MeCl2, Lot 0000152943     | 1 mL                 | MS14DTA_00024       | 500 uL       | 1,4-Dioxane             | 50 ug/mL      |
|                      |          |           |                           |                      |                     |              | Nitrobenzene-d5         | 50 ug/mL      |
|                      |          |           |                           |                      | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4  | 10 ug/mL      |
| .MS14DTA_00024       | 02/21/18 | 02/21/17  | MeCl2, Lot 0000152943     | 10 mL                | MS14DTA_00023       | 500 uL       | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270SU_00100      | 200 uL       | Nitrobenzene-d5         | 100 ug/mL     |
| ..MS14DTA_00023      | 02/21/18 |           | Restek, Lot A0121319      |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| ..MS8270SU_00100     | 02/21/18 |           | Restek, Lot A0103960      |                      | (Purchased Reagent) |              | Nitrobenzene-d5         | 5000 ug/mL    |
| .MS8270IS_00016      | 01/12/18 |           | Restek, Lot A0120796      |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |
| <b>MS14DL8_00005</b> | 01/12/18 | 02/21/17  | MeCl2, Lot 0000152943     | 1 mL                 | MS14DTA_00024       | 1000 uL      | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      |                     |              | Nitrobenzene-d5         | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270IS_00016      | 5 uL         | 1,4-Dichlorobenzene-d4  | 10 ug/mL      |
| .MS14DTA_00024       | 02/21/18 | 02/21/17  | MeCl2, Lot 0000152943     | 10 mL                | MS14DTA_00023       | 500 uL       | 1,4-Dioxane             | 100 ug/mL     |
|                      |          |           |                           |                      | MS8270SU_00100      | 200 uL       | Nitrobenzene-d5         | 100 ug/mL     |
| ..MS14DTA_00023      | 02/21/18 |           | Restek, Lot A0121319      |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| ..MS8270SU_00100     | 02/21/18 |           | Restek, Lot A0103960      |                      | (Purchased Reagent) |              | Nitrobenzene-d5         | 5000 ug/mL    |
| .MS8270IS_00016      | 01/12/18 |           | Restek, Lot A0120796      |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |
| <b>MS14DSP_00030</b> | 06/20/17 | 12/20/16  | Methanol, Lot 0000152413  | 100 mL               | MS14DTA_00022       | 1 mL         | 1,4-Dioxane             | 20 ug/mL      |
| .MS14DTA_00022       | 09/30/18 |           | SUPELCO, Lot LC16305V     |                      | (Purchased Reagent) |              | 1,4-Dioxane             | 2000 ug/mL    |
| <b>MS14DSU_00003</b> | 03/21/17 | 10/31/16  | Methanol, Lot 00000142776 | 200 mL               | MS8270SU_00094      | 20 mL        | 2,4,6-Tribromophenol    | 10 ug/mL      |
|                      |          |           |                           |                      |                     |              | 2-Fluorobiphenyl (Surr) | 10 ug/mL      |
|                      |          |           |                           |                      |                     |              | 2-Fluorophenol          | 10 ug/mL      |
|                      |          |           |                           |                      |                     |              | Nitrobenzene-d5         | 10 ug/mL      |

## REAGENT TRACEABILITY SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

| Reagent ID      | Exp Date | Prep Date            | Dilutant Used | Reagent Final Volume | Parent Reagent      |              | Analyte                 | Concentration |
|-----------------|----------|----------------------|---------------|----------------------|---------------------|--------------|-------------------------|---------------|
|                 |          |                      |               |                      | Reagent ID          | Volume Added |                         |               |
|                 |          |                      |               |                      |                     |              | Phenol-d5               | 10 ug/mL      |
|                 |          |                      |               |                      |                     |              | Terphenyl-d14           | 10 ug/mL      |
| .MS8270SU_00094 | 03/21/17 | Restek, Lot A0117528 |               |                      | (Purchased Reagent) |              | 2,4,6-Tribromophenol    | 100 ug/mL     |
|                 |          |                      |               |                      |                     |              | 2-Fluorobiphenyl (Surr) | 100 ug/mL     |
|                 |          |                      |               |                      |                     |              | 2-Fluorophenol          | 100 ug/mL     |
|                 |          |                      |               |                      |                     |              | Nitrobenzene-d5         | 100 ug/mL     |
|                 |          |                      |               |                      |                     |              | Phenol-d5               | 100 ug/mL     |
|                 |          |                      |               |                      |                     |              | Terphenyl-d14           | 100 ug/mL     |
| MS8270IS_00016  | 01/12/18 | Restek, Lot A0120796 |               |                      | (Purchased Reagent) |              | 1,4-Dichlorobenzene-d4  | 2000 ug/mL    |

Reagent

---

**LC6:2FTS\_00002**



R: 8/23/16 SBC



715544

ID: LC6:2FTS\_00002

Exp: 06/25/21 Prod: SBC

6:2FTS



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

6:2FTS

**LOT NUMBER:**

62FTS0616

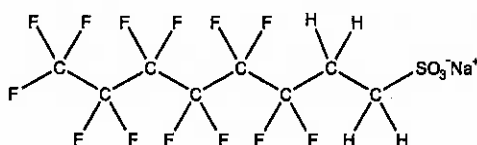
**COMPOUND:**

Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

C<sub>8</sub>H<sub>4</sub>F<sub>13</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:**

450.15

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)  
47.4 ± 2.4 µg/ml (6:2FTS anion)

**SOLVENT(S):**

Methanol

**CHEMICAL PURITY:**

>98%

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

06/25/2016

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

06/25/2021

**RECOMMENDED STORAGE:**

Refrigerate ampoule

**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.

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

Certified By:

B.G. Chittim

Date: 06/29/2016

(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:**

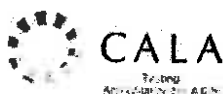
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

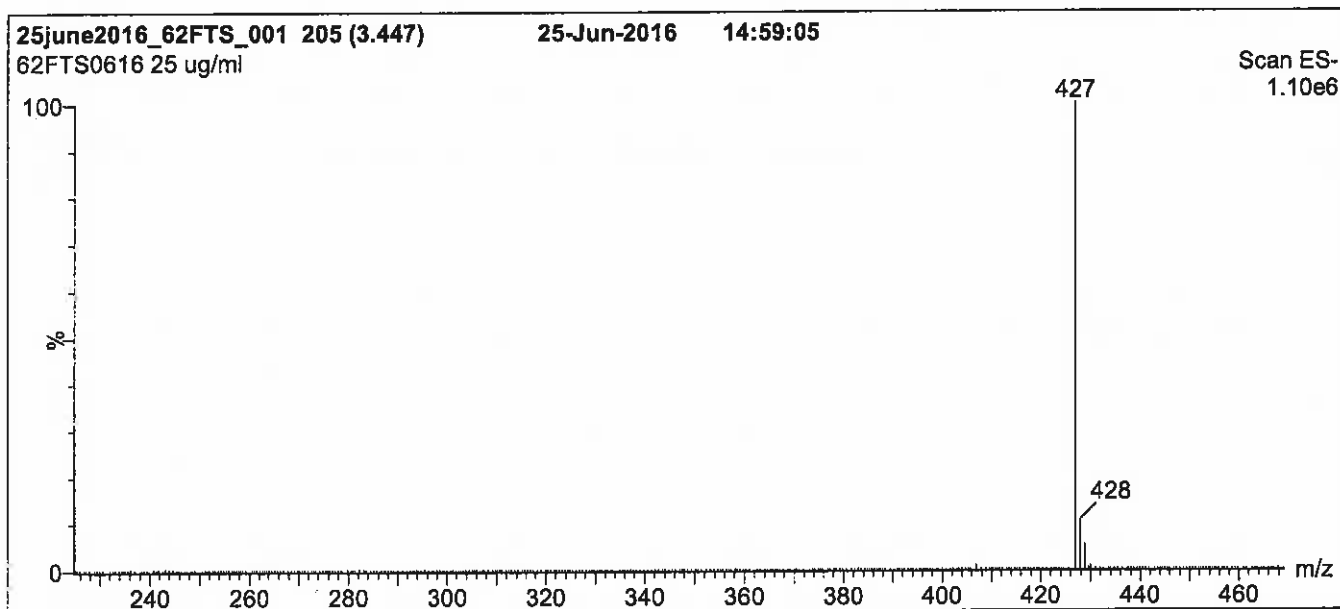
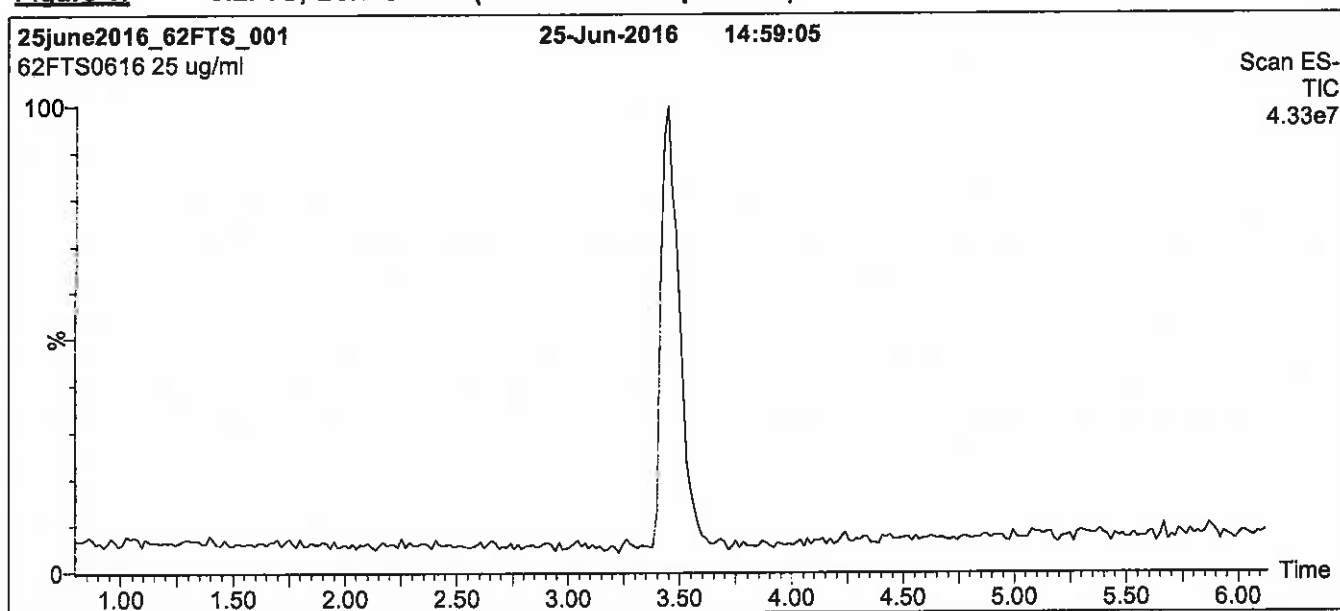
**QUALITY MANAGEMENT:**

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: 6:2FTS; 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

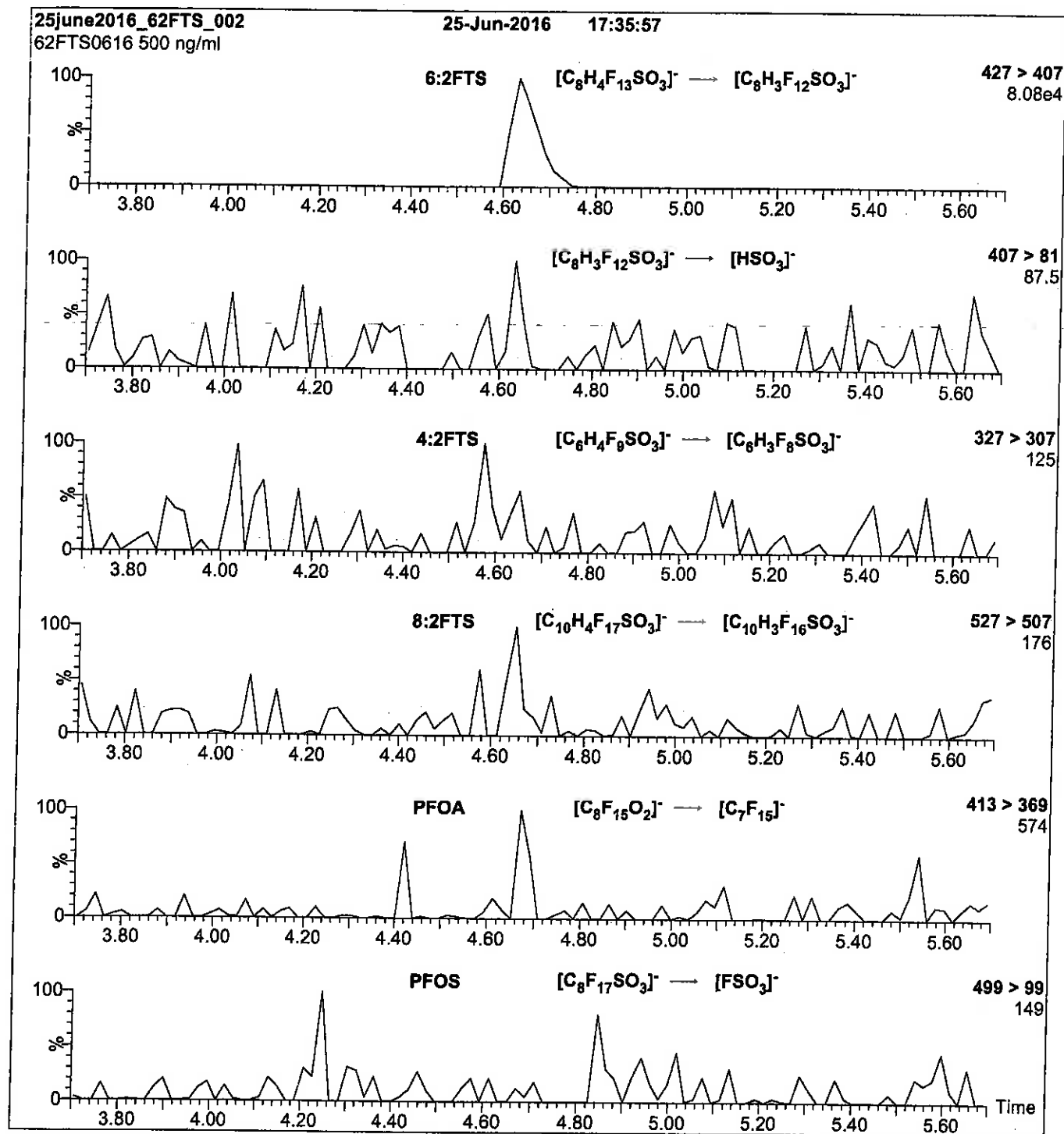
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 30.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: 6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop Injection  
10  $\mu$ l (500 ng/ml 6:2FTS)

Mobility 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) = 25

Reagent

---

**LC8 : 2FTS\_00002**

R: 8/23/16 SBC



715545  
ID: LC8:2FTS\_00002  
Exp: 10/23/20 Prod: SBC  
8:2FTS

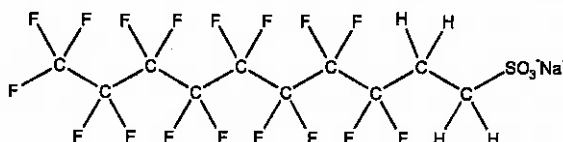


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** 8:2FTS **LOT NUMBER:** 82FTS1015  
**COMPOUND:** Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:**  $C_{10}H_4F_{17}SO_3Na$  **MOLECULAR WEIGHT:** 550.16  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol  
47.9 ± 2.4 µg/ml (8:2FTS anion)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 10/23/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 10/23/2020  
**RECOMMENDED STORAGE:** Refrigerate ampoule

### 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.

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

Certified By:

B.G. Chittim

Date: 10/27/2015  
(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.

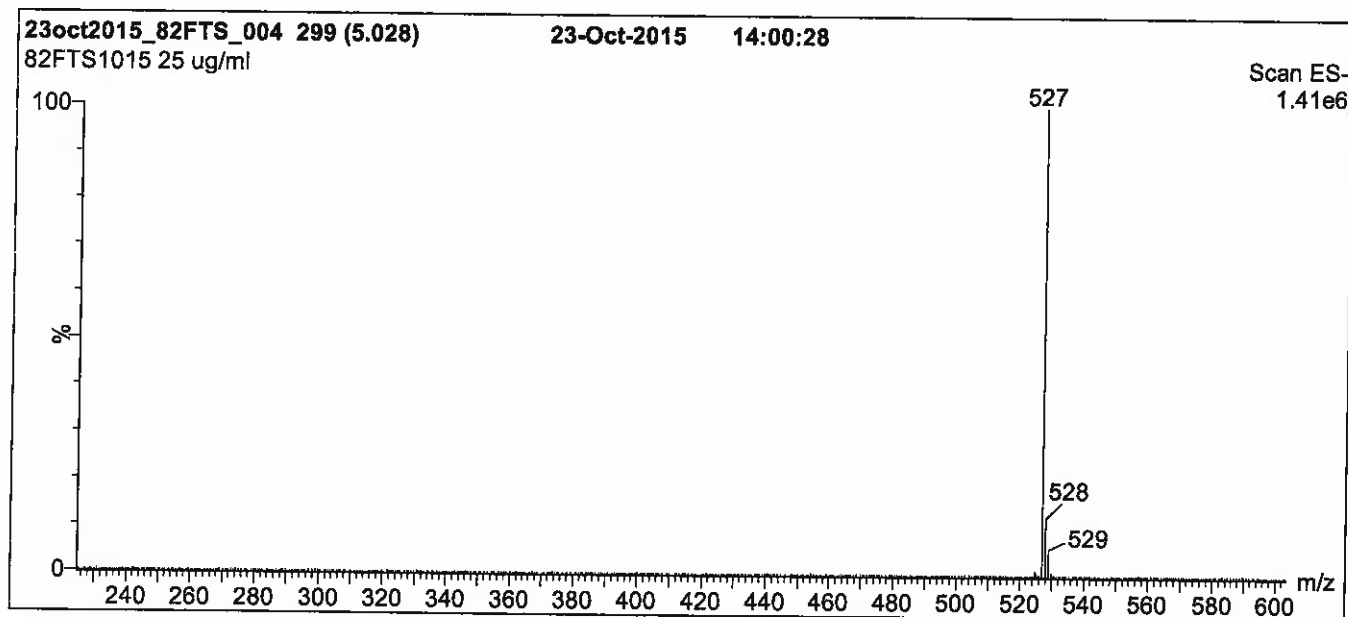
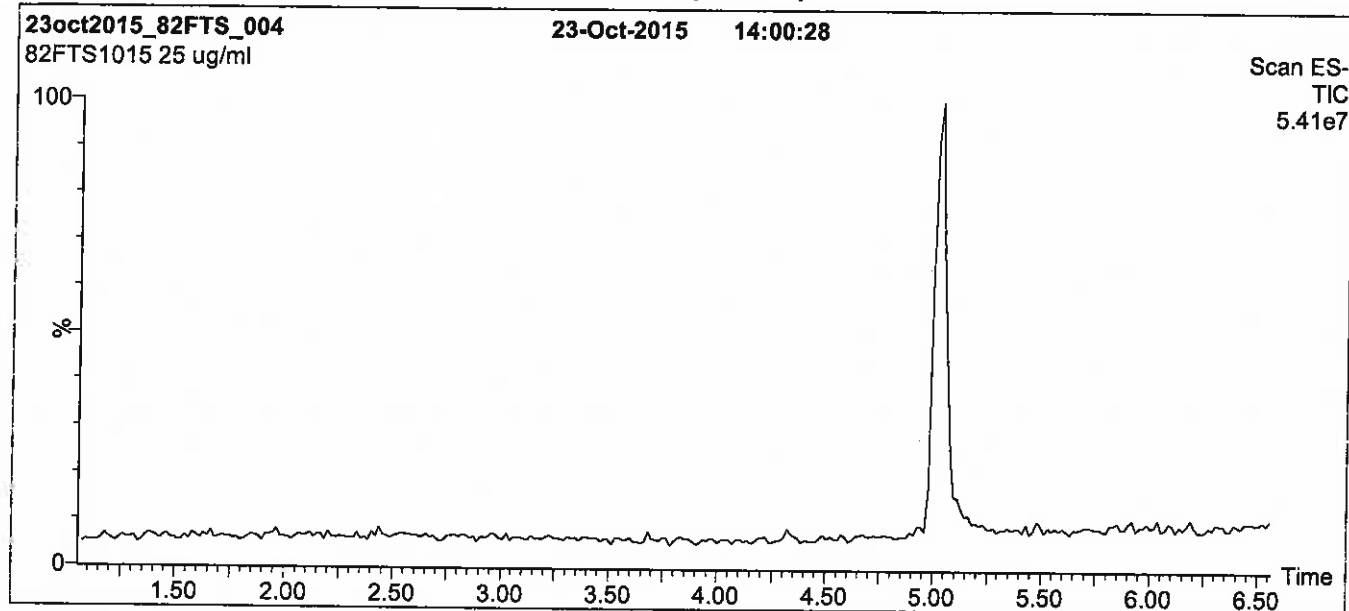
**QUALITY MANAGEMENT:**

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:** 8:2FTS; 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.  
Return to Initial conditions in 0.5 min.  
Time: 10 min

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

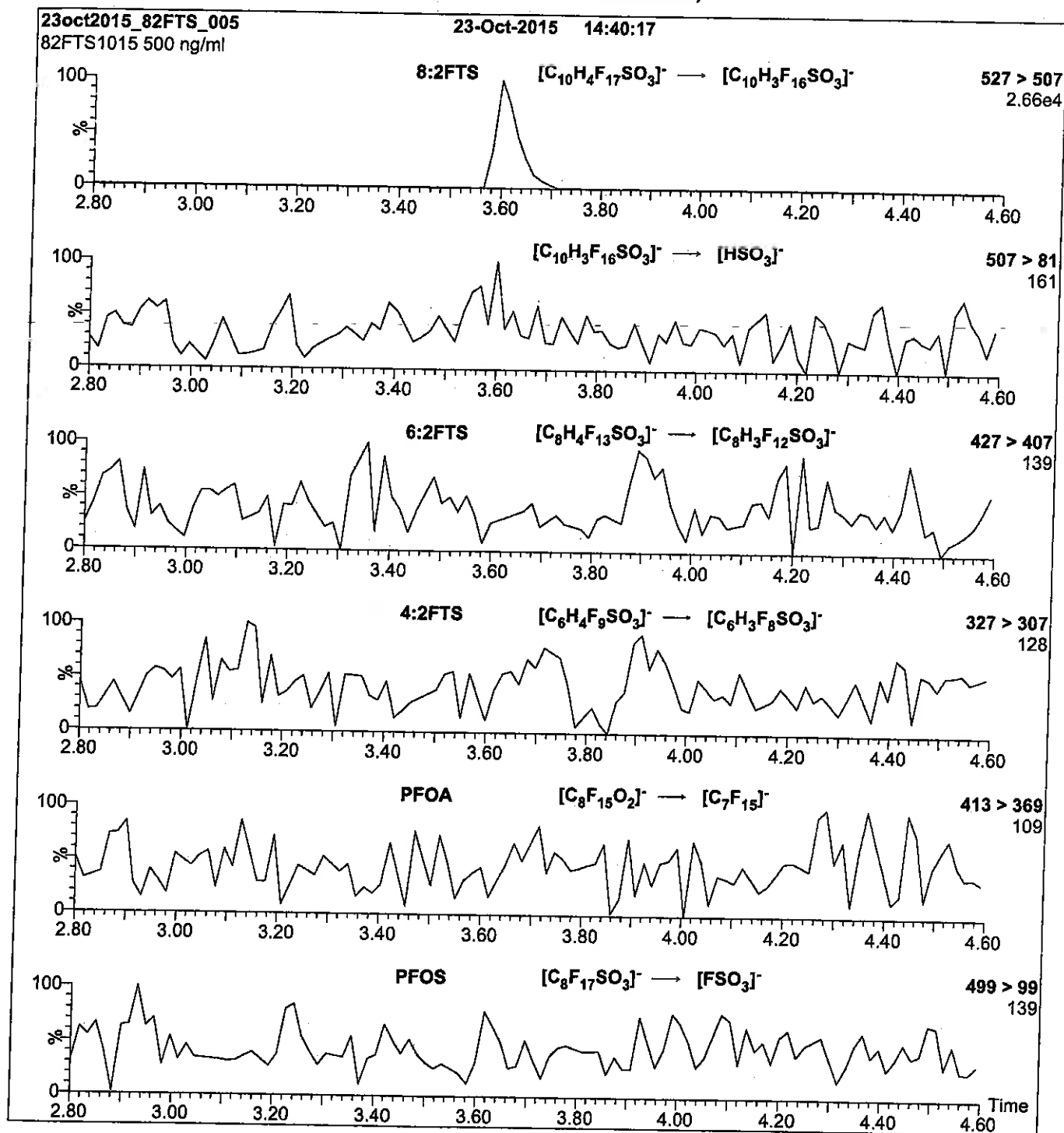
**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 30.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750



**Figure 2: 8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml 8:2FTS)

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) = 3.28e-3  
Collision Energy (eV) = 30

Reagent

---

**LCd-NMeFOSA-M\_00003**

R: 9/9/16 SBC



728303

ID: LCd-NMeFOSA-M\_00003

Exp: 06/10/21 Prep: SBC

d-N-MeFOSA-M



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

d-N-MeFOSA-M

**LOT NUMBER:**

dNMeFOSA0616M

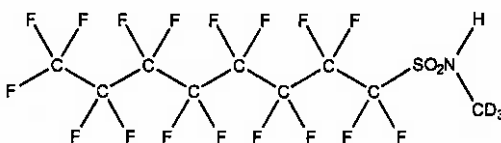
**COMPOUND:**

N-methyl-d<sub>3</sub>-perfluoro-1-octanesulfonamide

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

C<sub>8</sub>D<sub>3</sub>HF<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:**

50 ± 2.5 µg/ml

**CHEMICAL PURITY:**

>98%

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

06/10/2016

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

06/10/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:**

516.19

**SOLVENT(S):**

Methanol

**ISOTOPIC PURITY:**

≥98% <sup>2</sup>H<sub>3</sub>

**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.

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

Certified By:

B.G. Chittim

Date: 06/16/2016

(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.

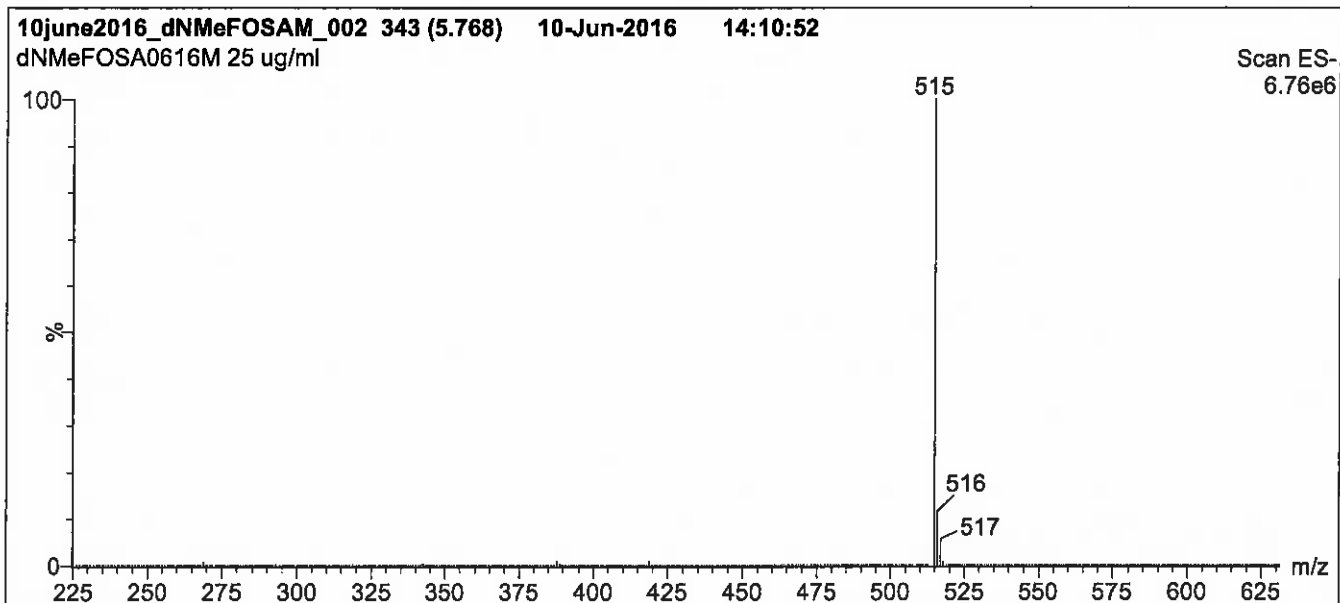
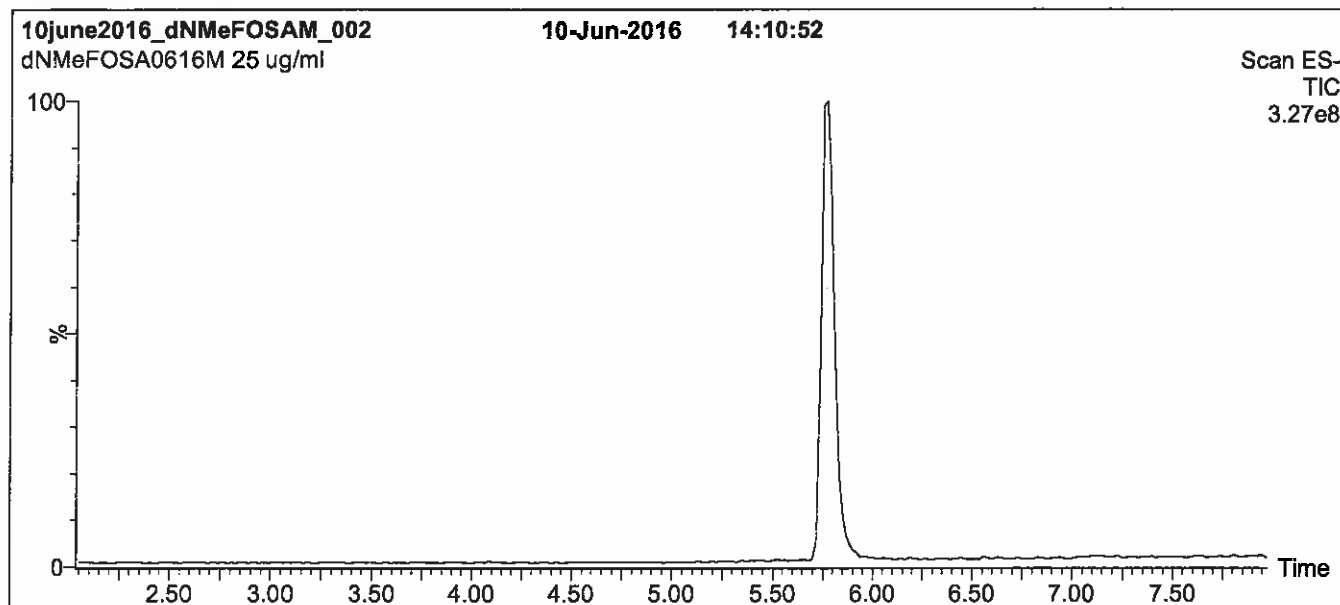
**QUALITY MANAGEMENT:**

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: d-N-MeFOSA-M; 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% H<sub>2</sub>O / 60% (80:20 MeOH:ACN)  
(both with 10mM 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

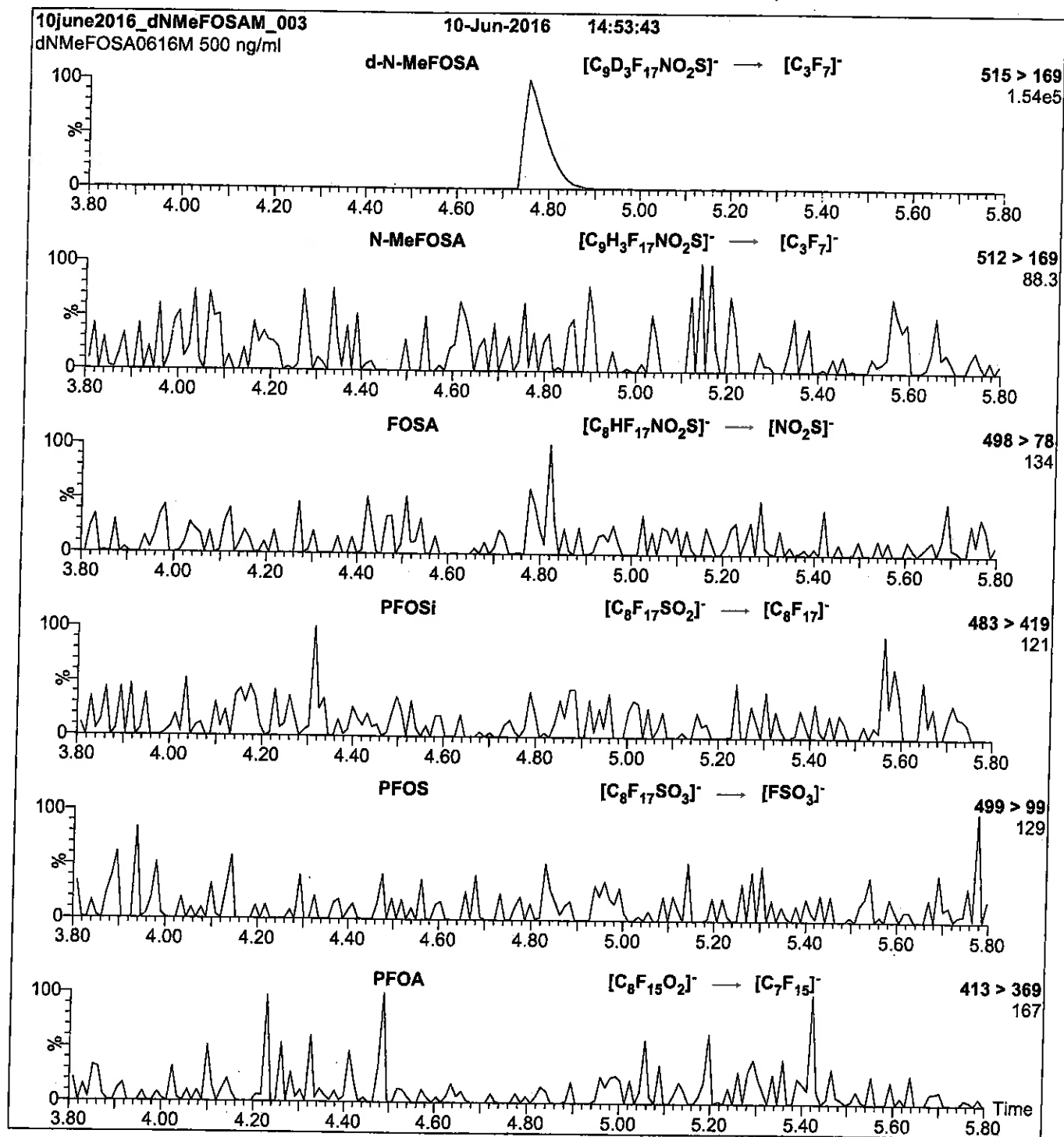
**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 2.50  
**Cone Voltage (V)** = 40.00  
**Cone Gas Flow (l/hr)** = 50  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2:** d-N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml d-N-MeFOSA-M)

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) = 3.39e-3  
Collision Energy (eV) = 25

Reagent

---

**LCd3-NMeFOSAA\_00003**

R: 9/9/16  
SBC



728300

ID: LCd3-NMeFOSAA\_00003

Exp: 05/31/21 Prod: SBC  
d3-N-MeFOSAA



WELLINGTON  
LABORATORIES

CERTIFICATE OF ANALYSIS  
DOCUMENTATION

**PRODUCT CODE:**

d3-N-MeFOSAA

**LOT NUMBER:**

d3NMeFOSAA0516

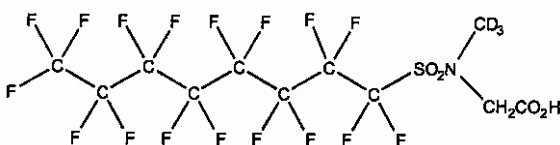
**COMPOUND:**

N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

C<sub>11</sub>D<sub>3</sub>H<sub>3</sub>F<sub>17</sub>NO<sub>4</sub>S

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

574.23

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥98% <sup>2</sup>H<sub>3</sub>

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

05/31/2016

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

05/31/2021

**RECOMMENDED STORAGE:**

Refrigerate ampoule

**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 the conversion of the acetic acid moiety to the methyl ester.
- Contains ~ 1% of branched isomer.

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

Certified By:

B.G. Chittim

Date: 06/01/2016

(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.

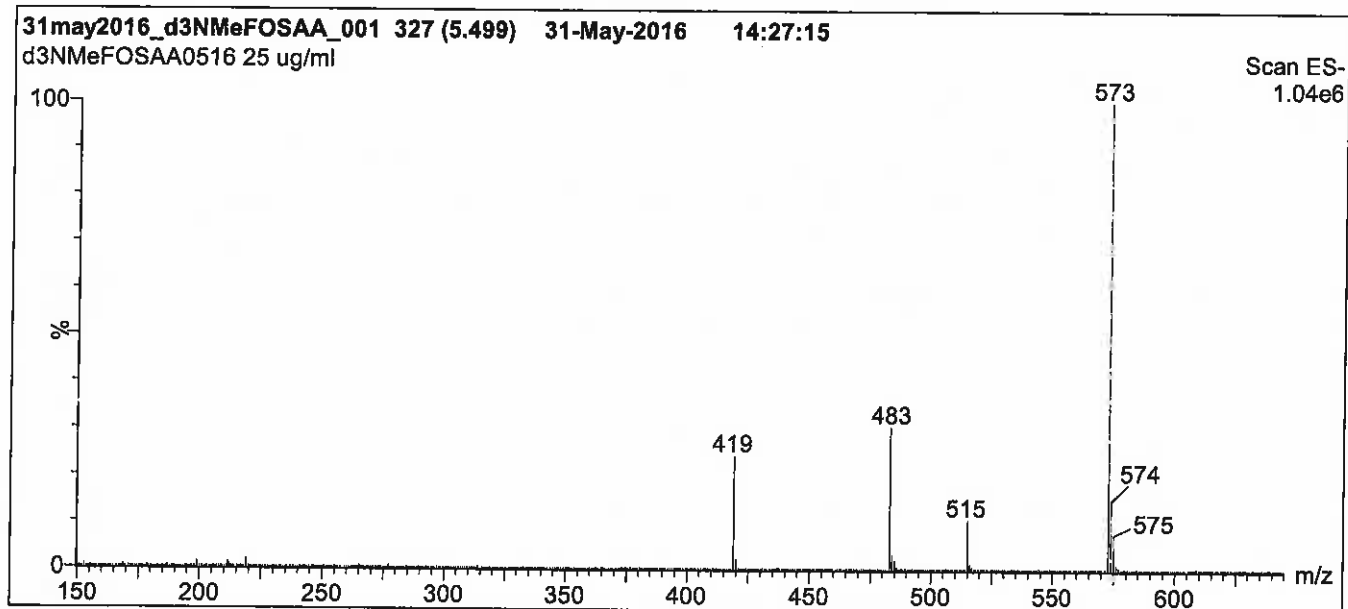
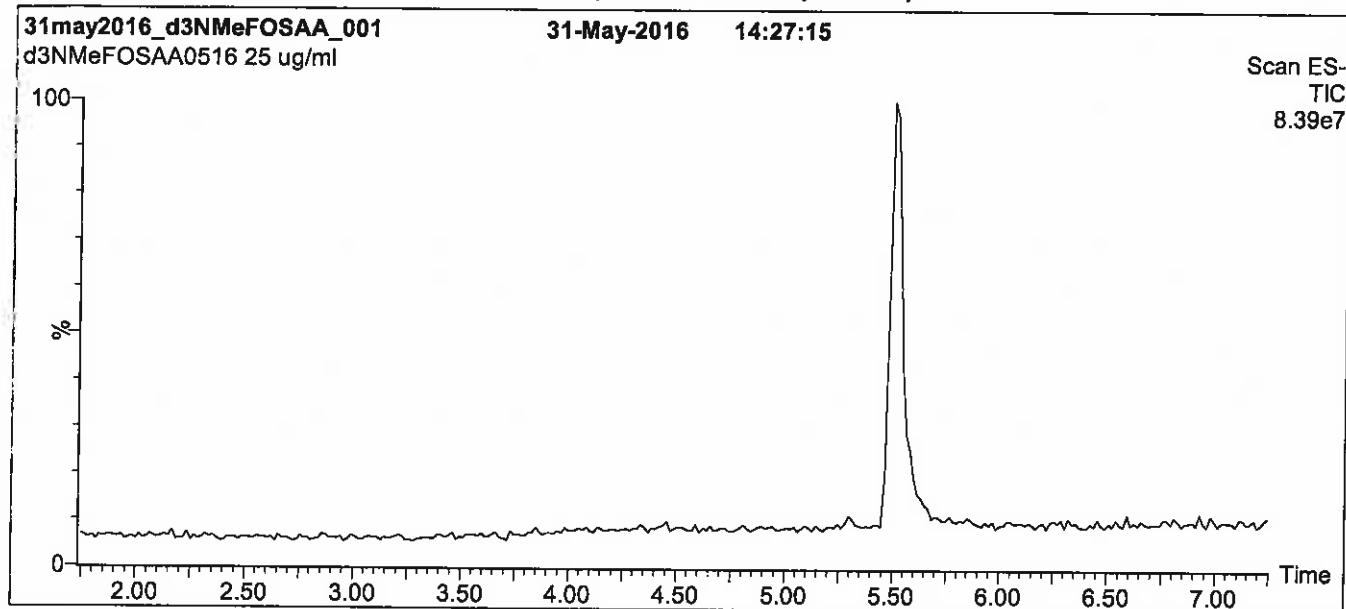
**QUALITY MANAGEMENT:**

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:** d3-N-MeFOSAA; 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

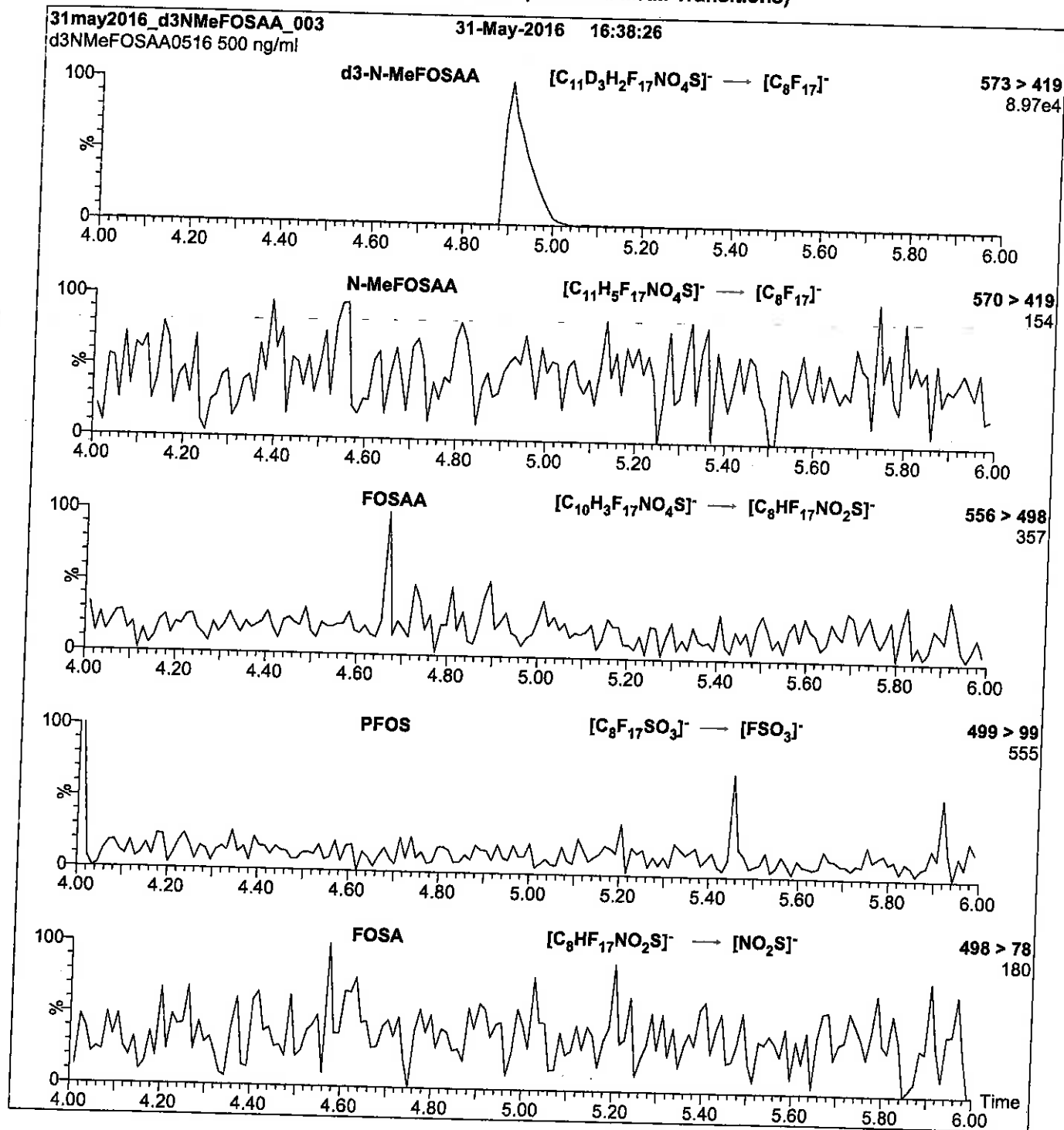
**Flow:** 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 35.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10 µl (500 ng/ml d3-N-MeFOSAA)

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 µl/min

**MS Parameters**

Collision Gas (mbar) = 3.43e-3  
Collision Energy (eV) = 25

Reagent

---

**LCd5-NEtFOSAA\_00003**

R: 9/9/16 SBC



728301

ID: LCd5-NEtFOSAA\_00003

Exp: 08/02/21 Ppdt: SBC

d5-N-EtFOSAA



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

d5-N-EtFOSAA

**LOT NUMBER:**

d5NEtFOSAA0716

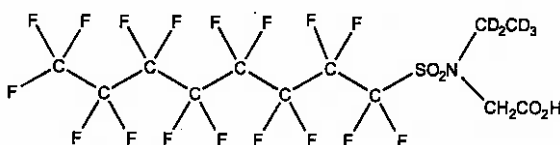
**COMPOUND:**

N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

C<sub>12</sub>D<sub>8</sub>H<sub>3</sub>F<sub>17</sub>NO<sub>4</sub>S

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

590.26

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥98% <sup>2</sup>H<sub>5</sub>

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

08/02/2016

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

08/02/2021

**RECOMMENDED STORAGE:**

Refrigerate ampoule

**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 the conversion of the acetic acid moiety to the methyl ester.

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

Certified By:

B.G. Chittim

Date: 08/09/2016

(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.

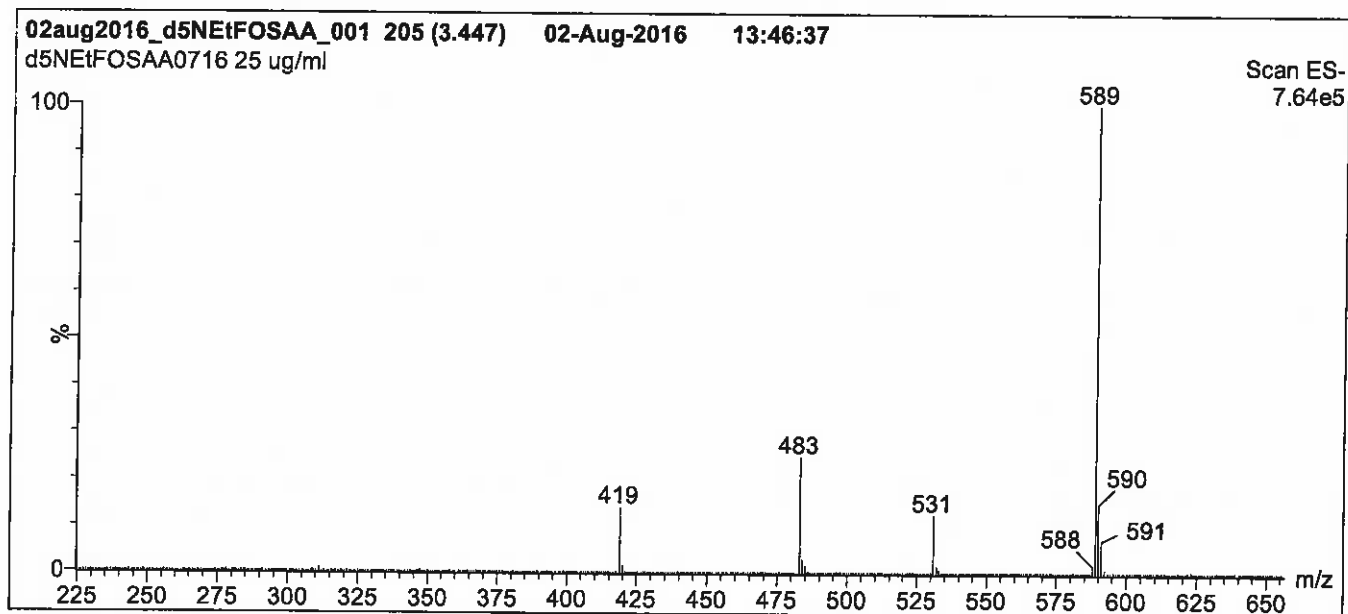
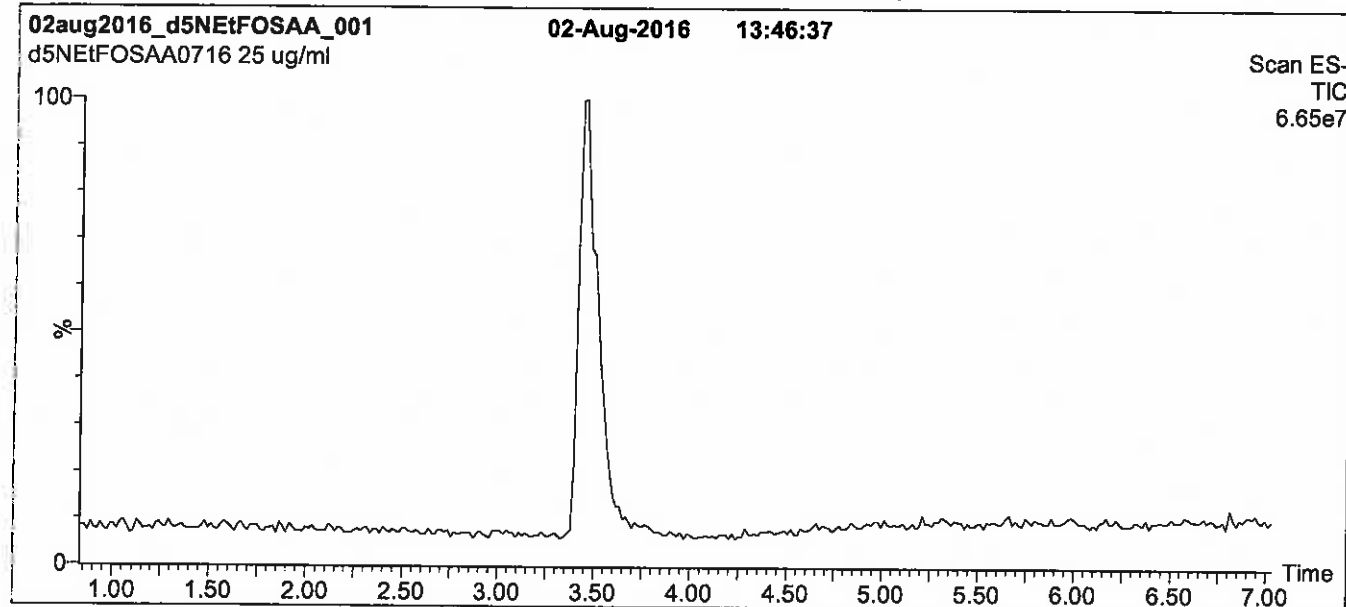
### **QUALITY MANAGEMENT:**

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:** d5-N-EtFOSAA; 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: 65% (80:20 MeOH:ACN) / 35% 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

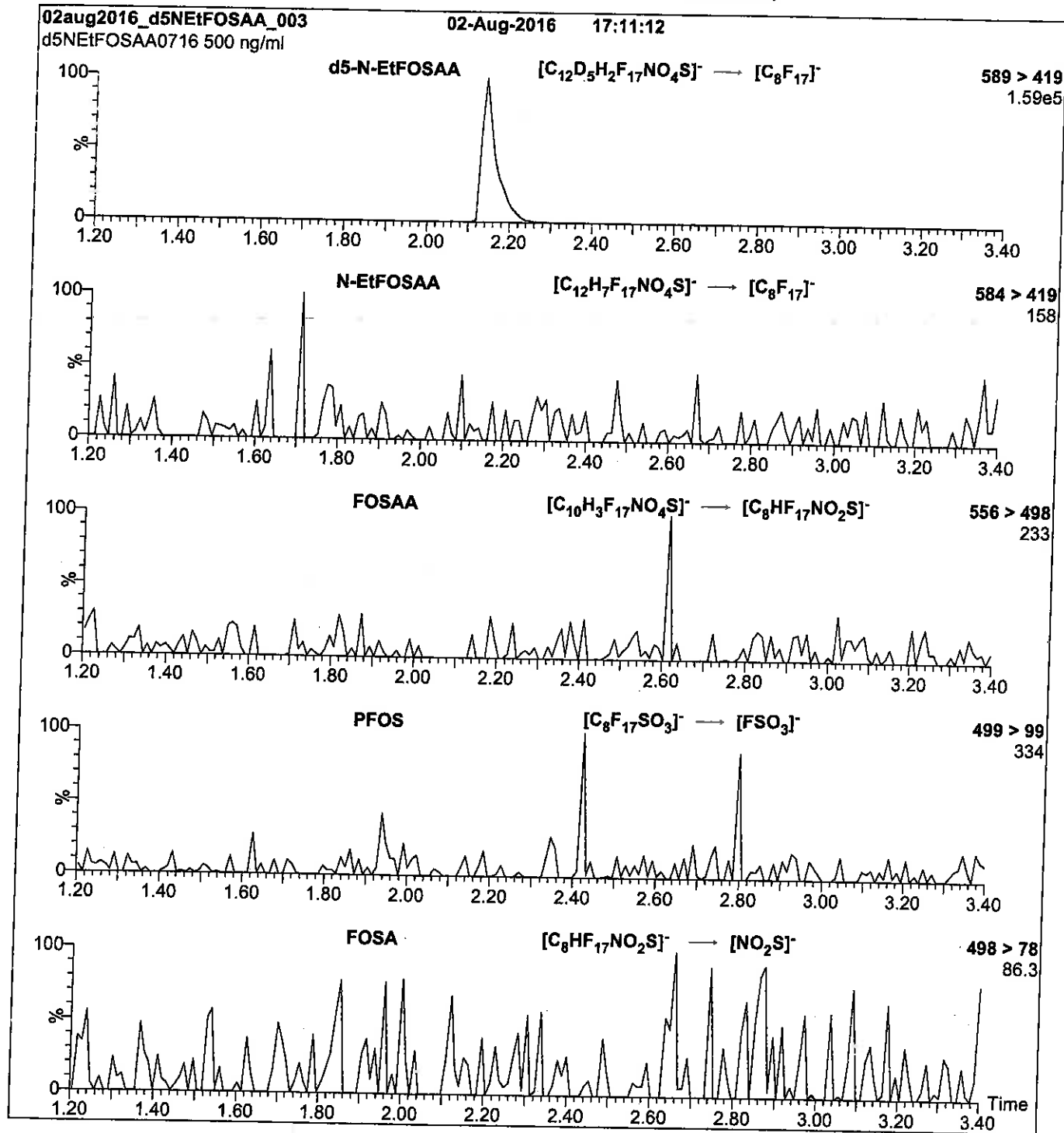
Flow: 350  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 35.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml d5-N-EtFOSAA)

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) = 3.43e-3  
Collision Energy (eV) = 25



Reagent

---

**LCM2-6:FTS\_00003**

R: 9/9/16 8BC



728304

ID: LCM2-6:FTS\_00003

Exp: 01/08/21 Prpt: SAC

M2-6:2FTS



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

M2-6:2FTS

**LOT NUMBER:**

M262FTS0116

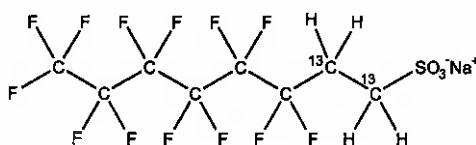
**COMPOUND:**

Sodium 1H,1H,2H,2H-perfluoro-[1,2-<sup>13</sup>C<sub>2</sub>]octane sulfonate

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>6</sub>H<sub>4</sub>F<sub>13</sub>SO<sub>3</sub>Na

**MOLECULAR WEIGHT:**

452.13

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)  
47.5 ± 2.4 µg/ml (M2-6:2FTS anion)

**SOLVENT(S):**

Methanol

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

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

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

01/08/2016

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

01/08/2021

**RECOMMENDED STORAGE:**

Refrigerate ampoule

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

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

Certified By:

B.G. Chittim

Date: 01/11/2016

(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.

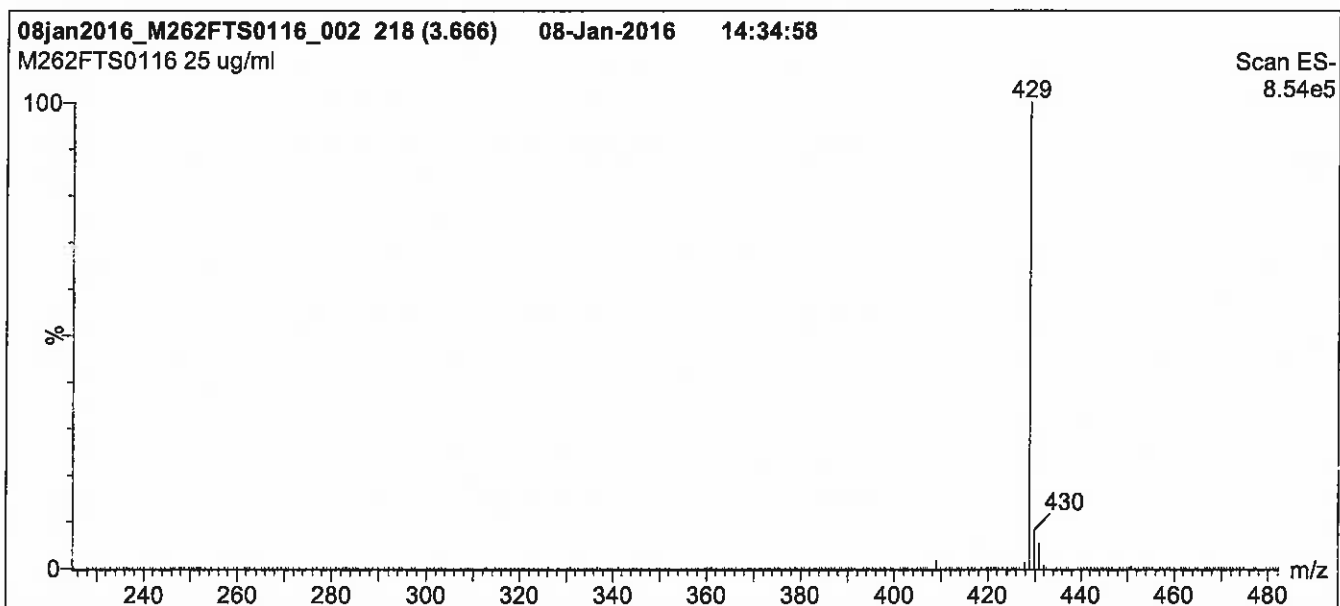
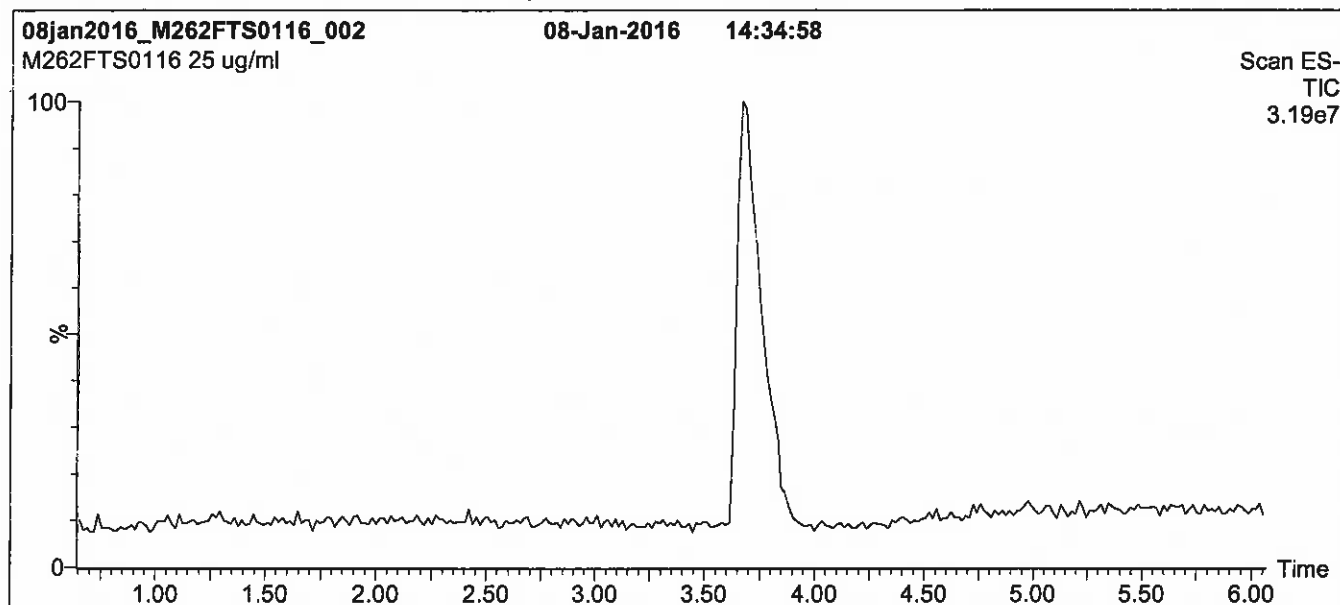
### **QUALITY MANAGEMENT:**

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: M2-6:2FTS; 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

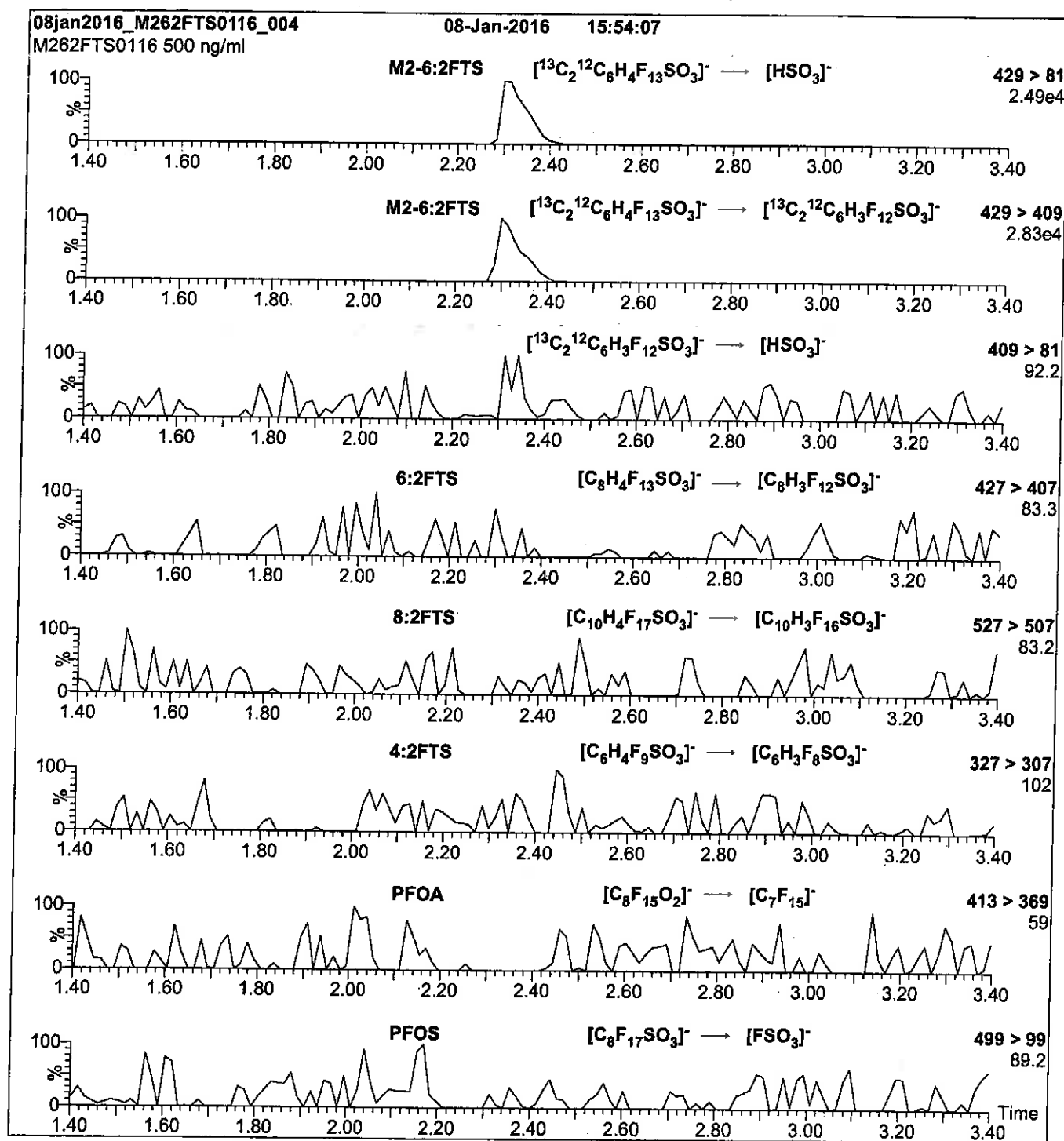
**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 3.00  
**Cone Voltage (V)** = 30.00  
**Cone Gas Flow (l/hr)** = 100  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2: M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M2-6:2FTS)

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

Reagent

---

**LCM2PFHxDA\_00008**

R: 8BC 9/22/16



739512

ID: LCM2PFHxDA\_00008

Exp: 01/07/21 Prod: SBC

<sup>13</sup>C2-PFHxDA at 50ug/mL

# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

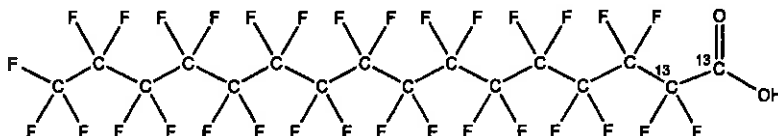
M2PFHxDA

**LOT NUMBER:**

M2PFHxDA1112

**COMPOUND:**Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]hexadecanoic acid**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>14</sub>HF<sub>31</sub>O<sub>2</sub>**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

816.11

**SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

**ISOTOPIC PURITY:**≥99% <sup>13</sup>C**LAST TESTED:** (mm/dd/yyyy)

01/07/2016

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

01/07/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

(1,2-<sup>13</sup>C<sub>2</sub>)**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 ~ 0.3% of native perfluoro-n-hexadecanoic acid.

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

Certified By:

  
B.G. Chittim

Date: 01/11/2016

(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:**

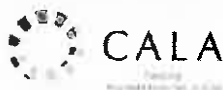
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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:**

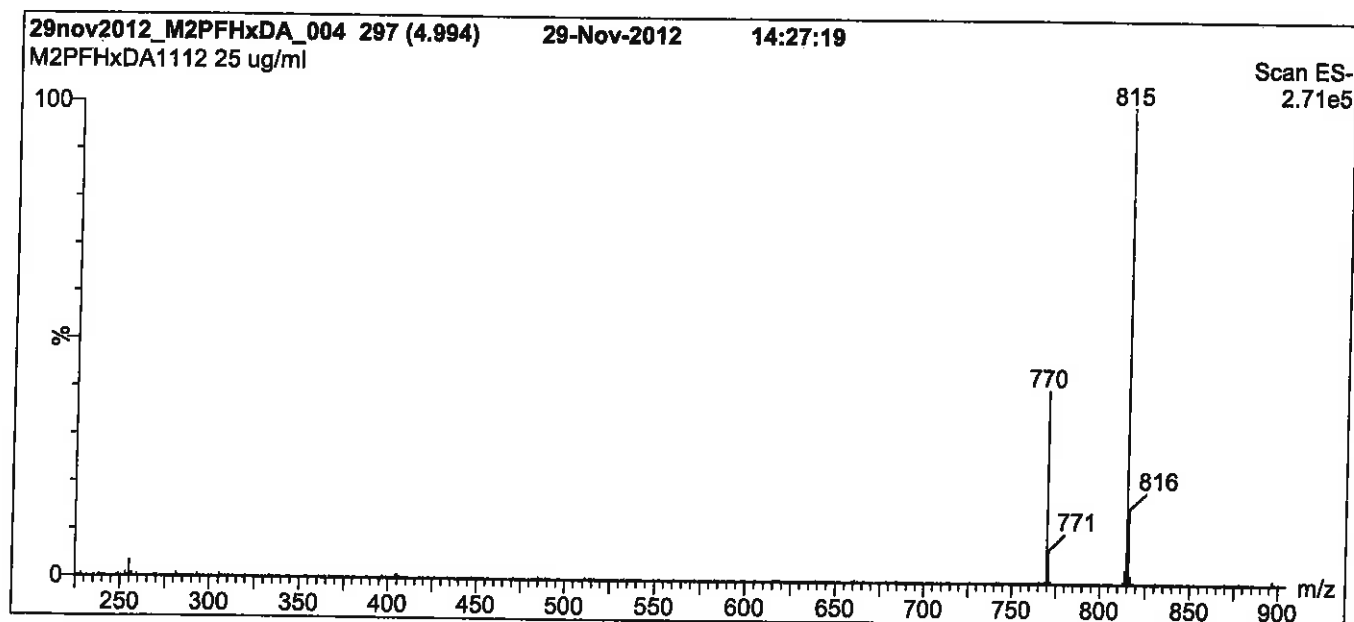
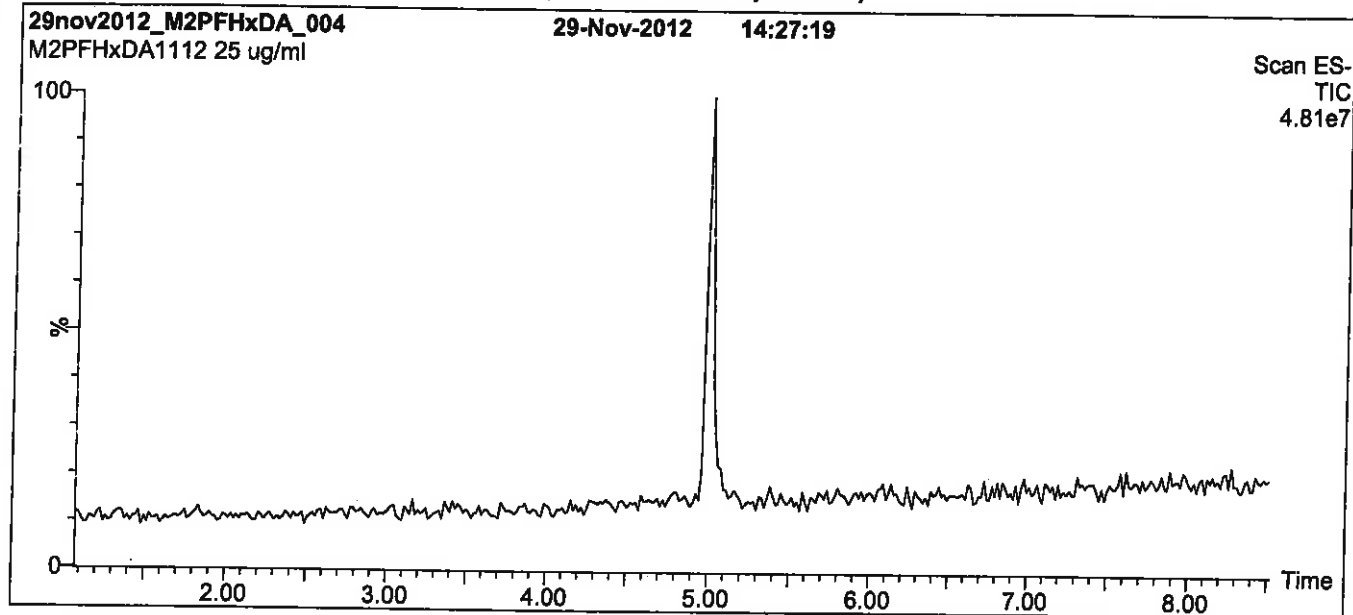
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*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: M2PFHxDA; 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: 60% (80:20 MeOH:ACN) / 40% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 100% organic over 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

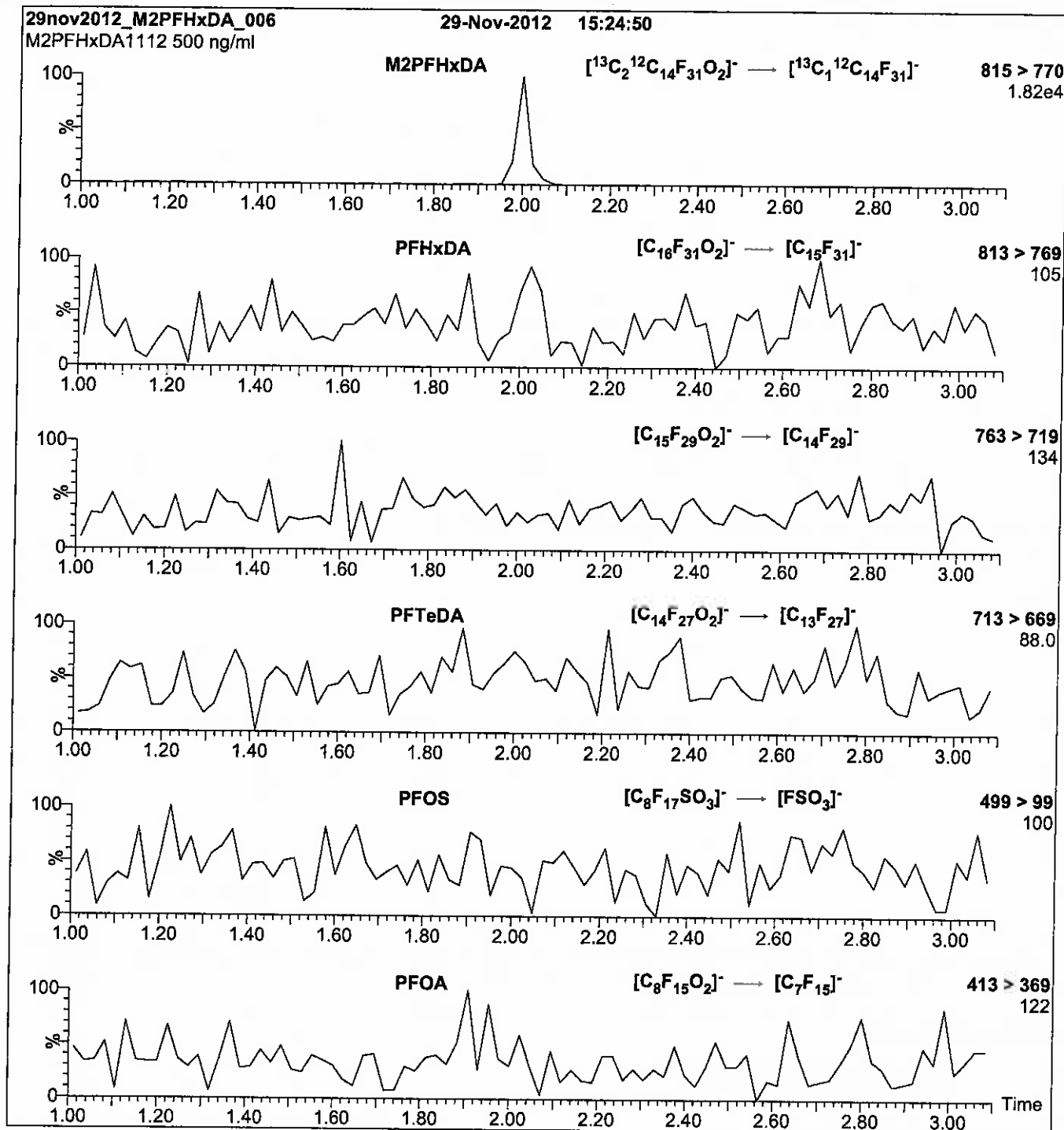
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (225 - 1200 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 2.00  
**Cone Voltage (V)** = 25.00  
**Cone Gas Flow (l/hr)** = 60  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2: M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M2PFHxDA)

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) =  $3.39\text{e-}3$   
Collision Energy (eV) = 15

Reagent

---

**LCM2PFTeDA\_00007**



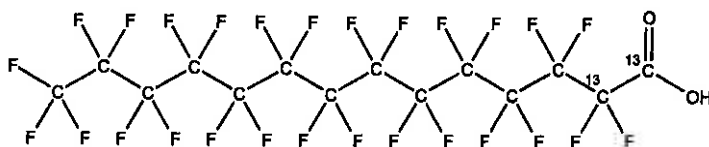
Scanned 10/14/16 R: 800 9/27/16  
**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
DOCUMENTATION

739563  
ID: LCM2PFTeDA\_00007  
Exp: 12/07/20 Prod: SEC  
13C2-PFTeDA at 50ug/mL

**PRODUCT CODE:** M2PFTeDA  
**COMPOUND:** Perfluoro-n-[1,2-<sup>13</sup>C<sub>2</sub>]tetradecanoic acid  
**LOT NUMBER:** M2PFTeDA1115

**STRUCTURE:**  
**CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>12</sub>HF<sub>27</sub>O<sub>2</sub>  
**CONCENTRATION:** 50 ± 2.5 µg/ml  
**MOLECULAR WEIGHT:** 716.10  
**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) 12/07/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 12/07/2020  
**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:** 12/08/2015  
(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:**

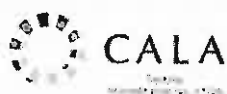
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

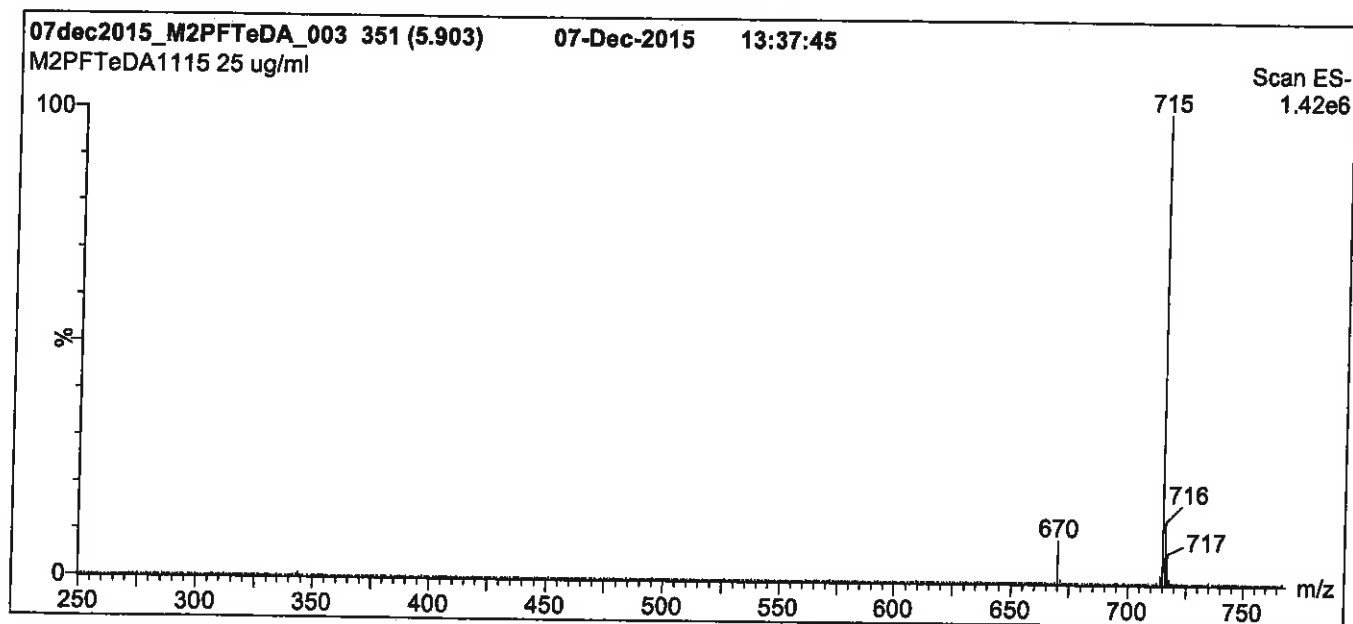
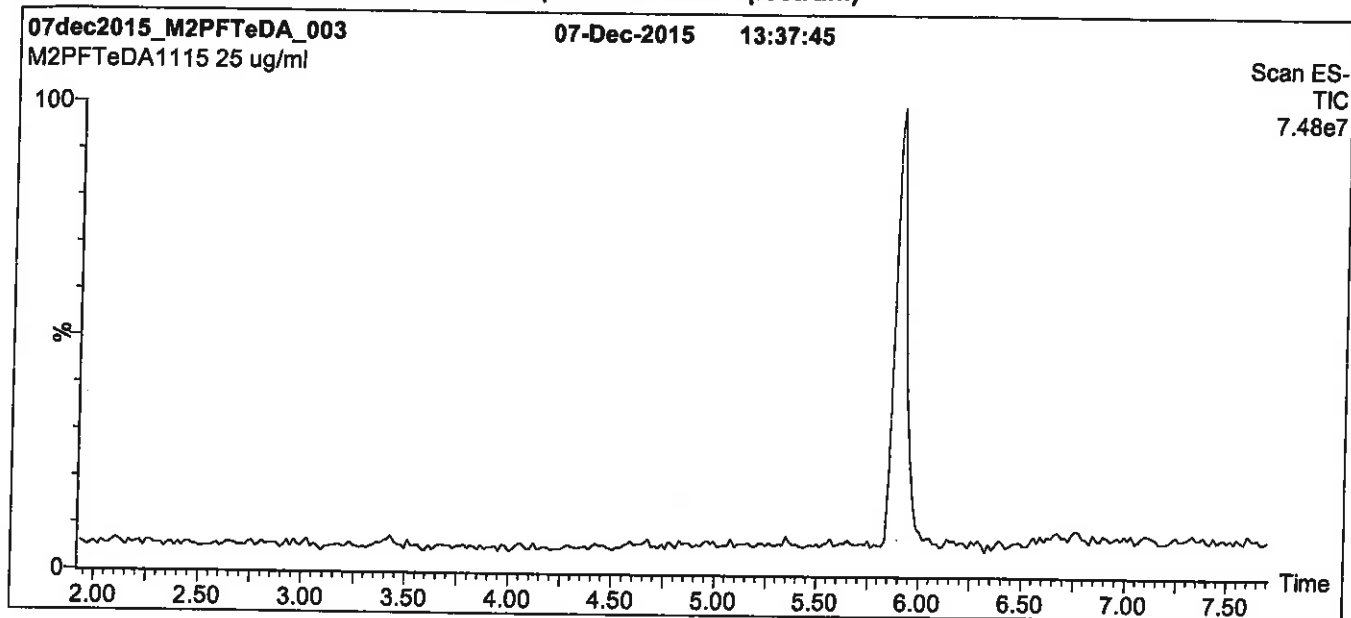
**QUALITY MANAGEMENT:**

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: M2PFTeDA; 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: 65% (80:20 MeOH:ACN) / 35% 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

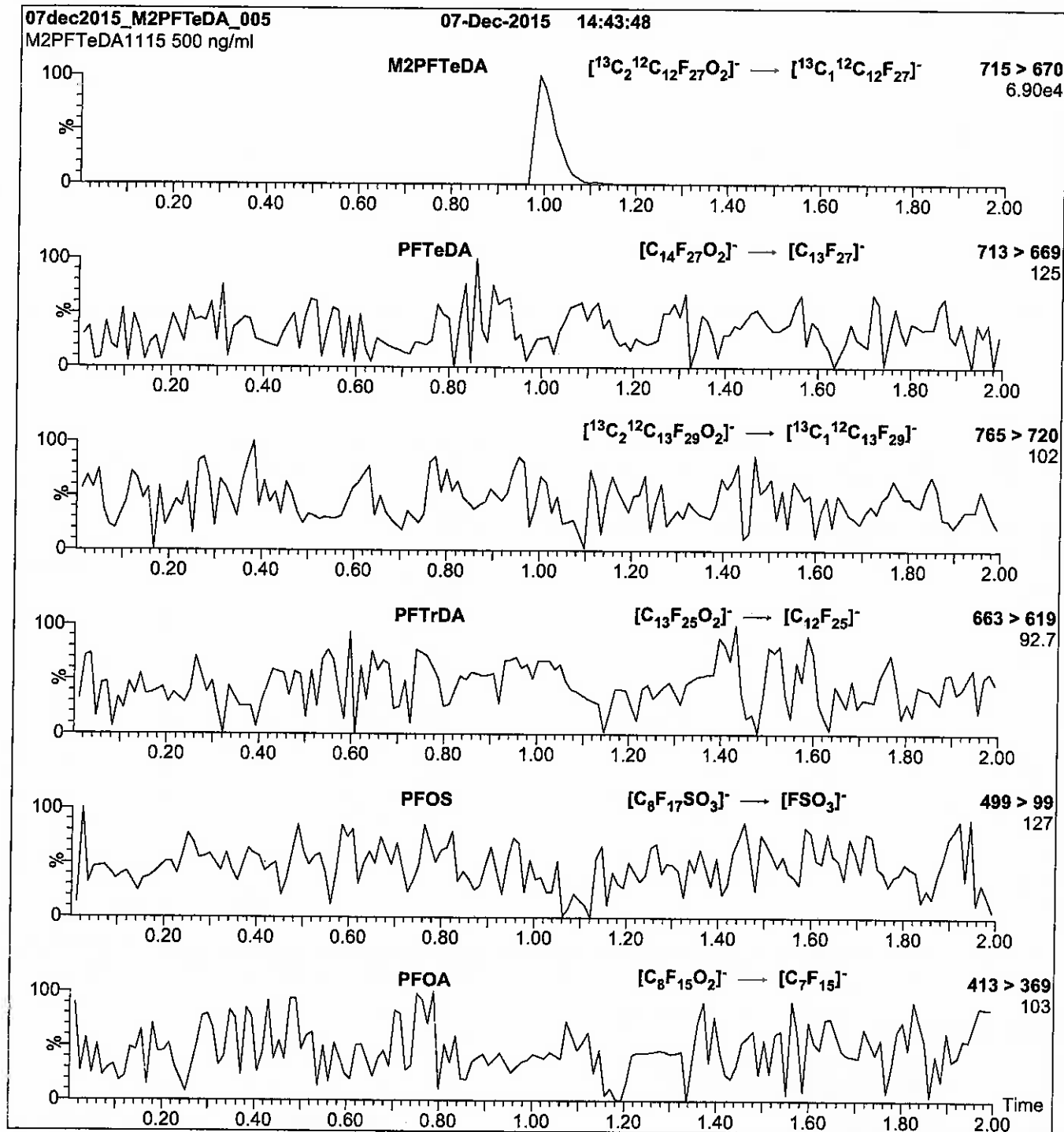
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (250 - 1250 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 3.00  
**Cone Voltage (V)** = 15.00  
**Cone Gas Flow (l/hr)** = 60  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2: M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
 10  $\mu\text{l}$  (500 ng/ml M2PFTeDA)

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) =  $3.28\text{e-}3$   
 Collision Energy (eV) = 14

Reagent

---

**LCM4PFHPA\_00007**



f: SBC 9/22/16

739567  
ID: LCM4PFHPA\_00007  
Exp: 05/27/21 Prpd: SBC  
13C4-Perfluoroheptanoic a



WELLINGTON  
LABORATORIES

CERTIFICATE OF ANALYSIS  
DOCUMENTATION

Scanned 10/14/16 SK

**PRODUCT CODE:**

M4PFHpA

**LOT NUMBER:**

M4PFHpA0516

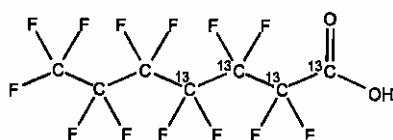
**COMPOUND:**

Perfluoro-n-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]heptanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>3</sub>HF<sub>13</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

368.03

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99%<sup>13</sup>C

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

05/27/2016

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

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

05/27/2021

**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: 07/05/2016

(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.

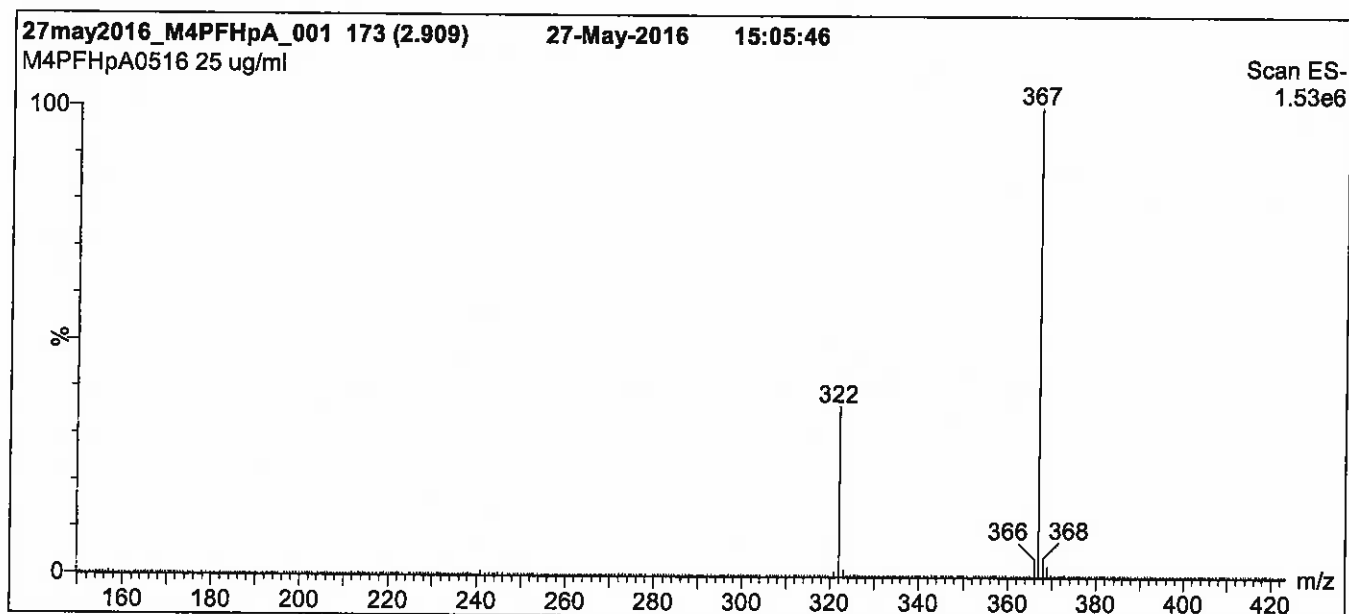
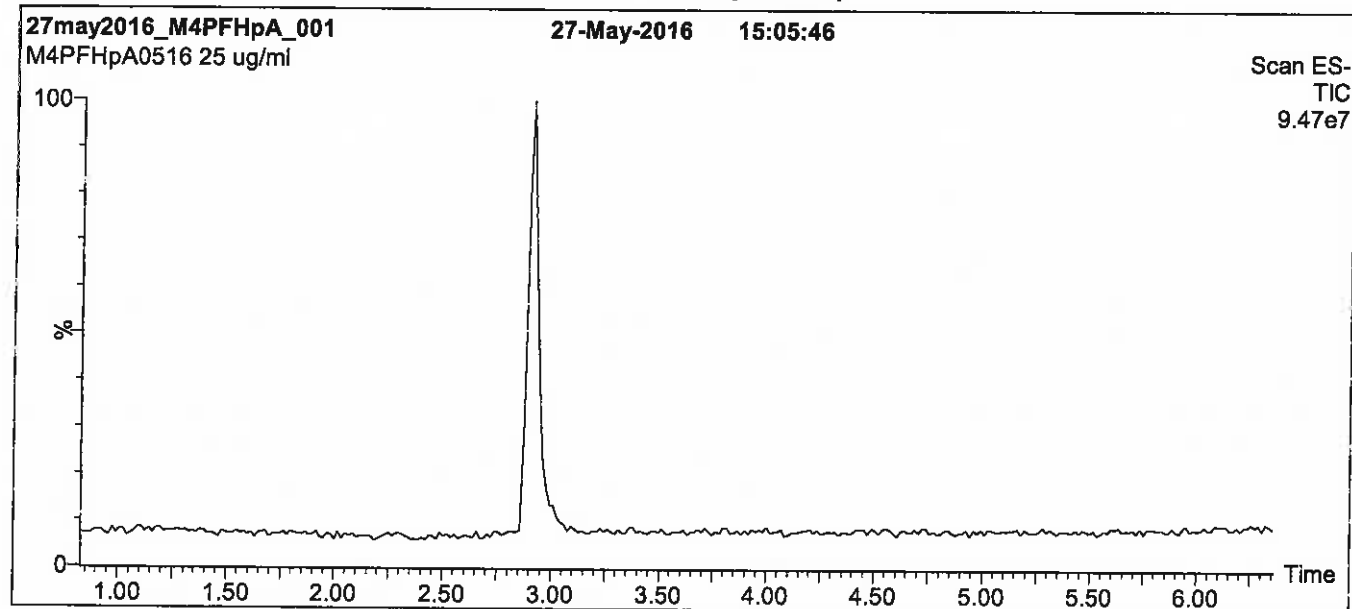
**QUALITY MANAGEMENT:**

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:** M4PFHpA; 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

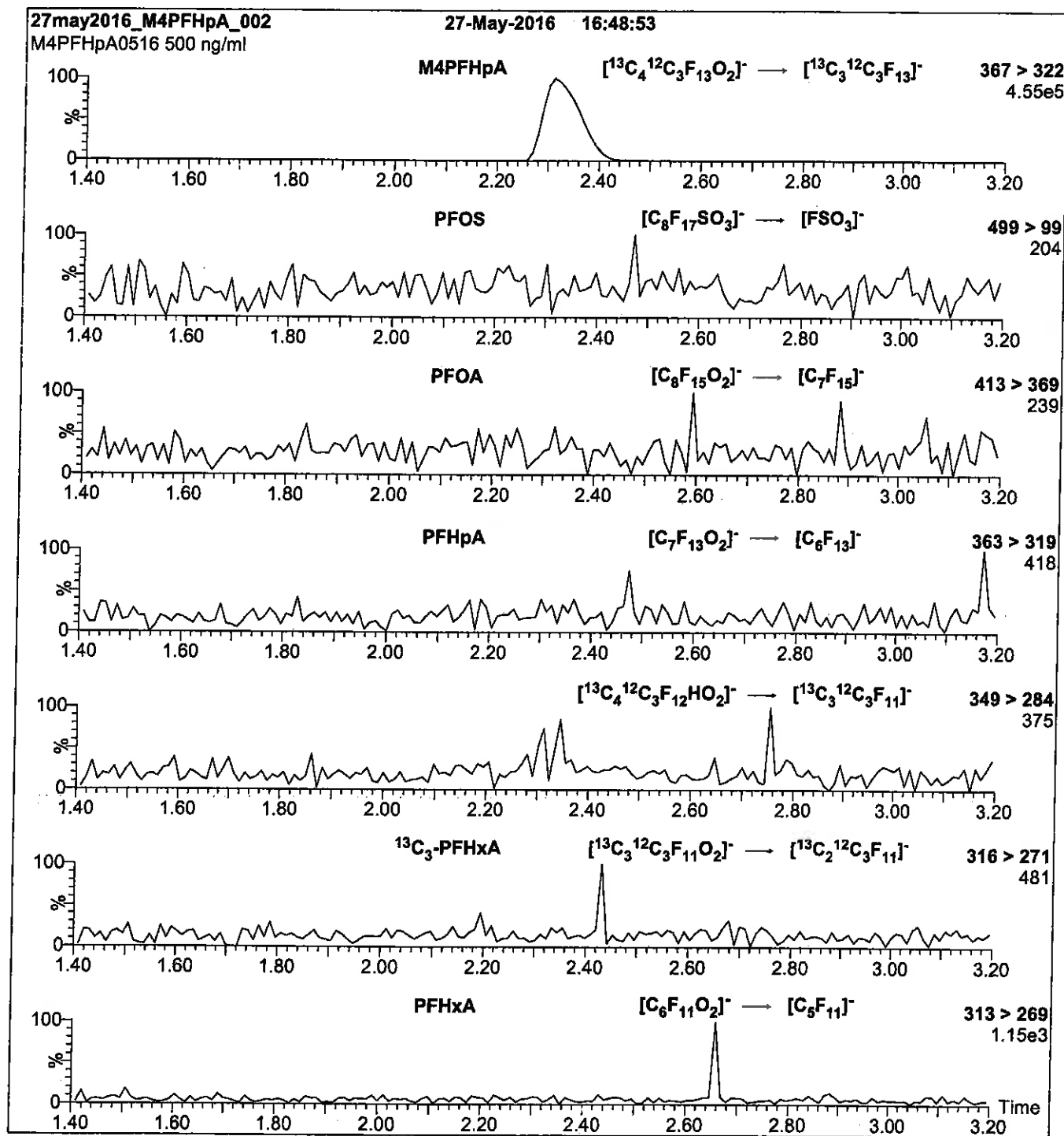
Flow: 300  $\mu$ l/min

**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: M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M4PFHpA)

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) = 3.35e-3  
Collision Energy (eV) = 11

Reagent

---

**LCM5PFPEA\_00008**

R: 8BC 9/22/16



739590

ID: LCM5PFPEA\_00008

Exp: 05/22/20 Prpt: SAC

<sup>13</sup>C<sub>5</sub>-Perfluoropentanoic a



WELLINGTON  
LABORATORIES

CERTIFICATE OF ANALYSIS  
DOCUMENTATION

Scanned 10/14/16 LR

**PRODUCT CODE:**

M5PFPeA

**LOT NUMBER:**

M5PFPeA0515

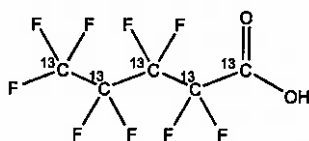
**COMPOUND:**

Perfluoro-n-[<sup>13</sup>C<sub>5</sub>]pentanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>5</sub>HF<sub>9</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

269.01

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

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

05/22/2015

(<sup>13</sup>C<sub>5</sub>)

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

05/22/2020

**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-pentanoic acid.

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

Certified By:

B.G. Chittim

Date: 05/25/2015

(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.

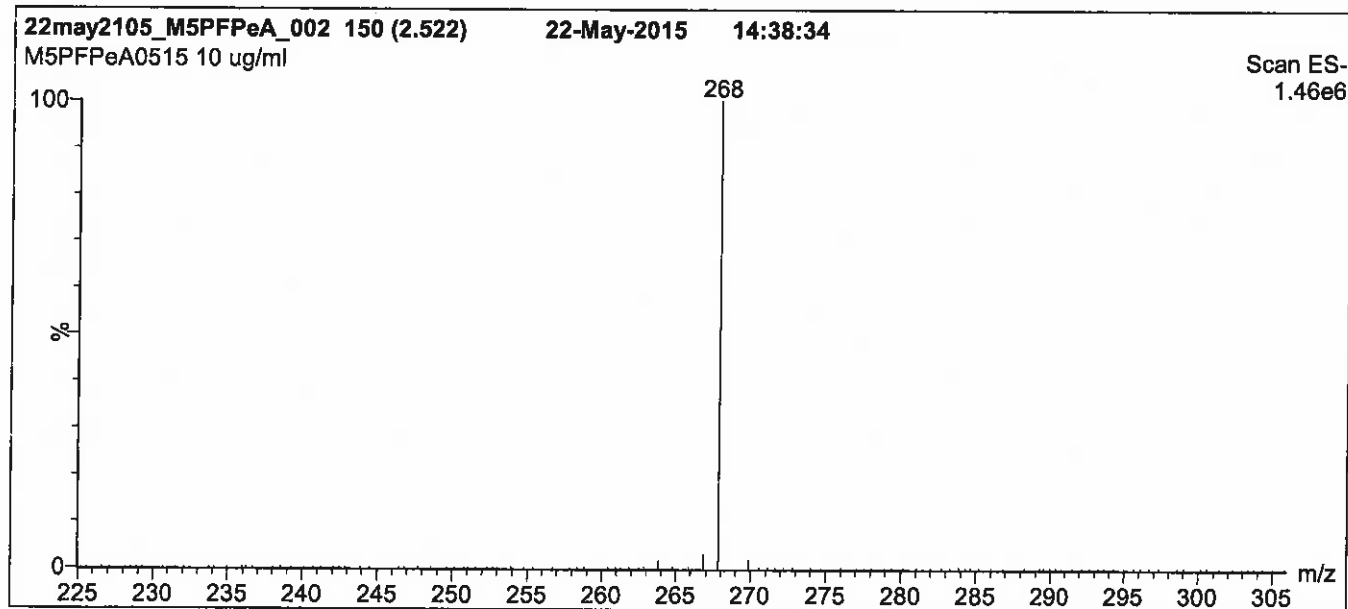
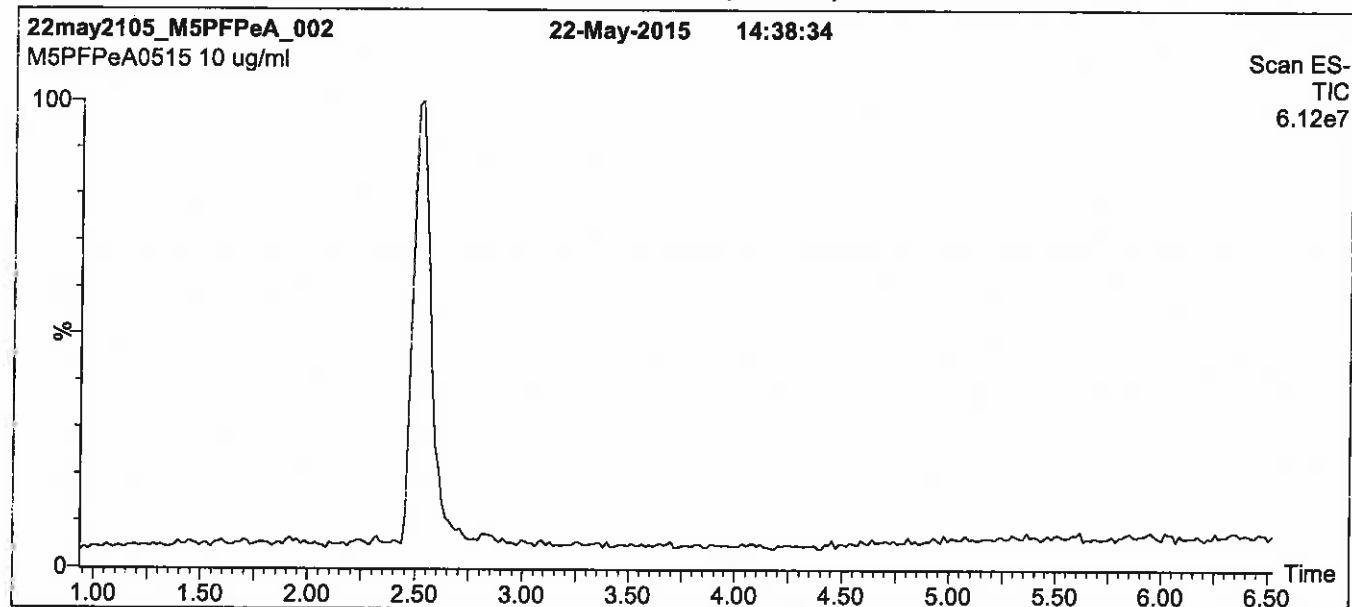
**QUALITY MANAGEMENT:**

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: M5PFPeA; 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  
1.5 min before returning to initial conditions in 0.5 min.  
Time: 10 min

Flow: 300  $\mu$ l/min

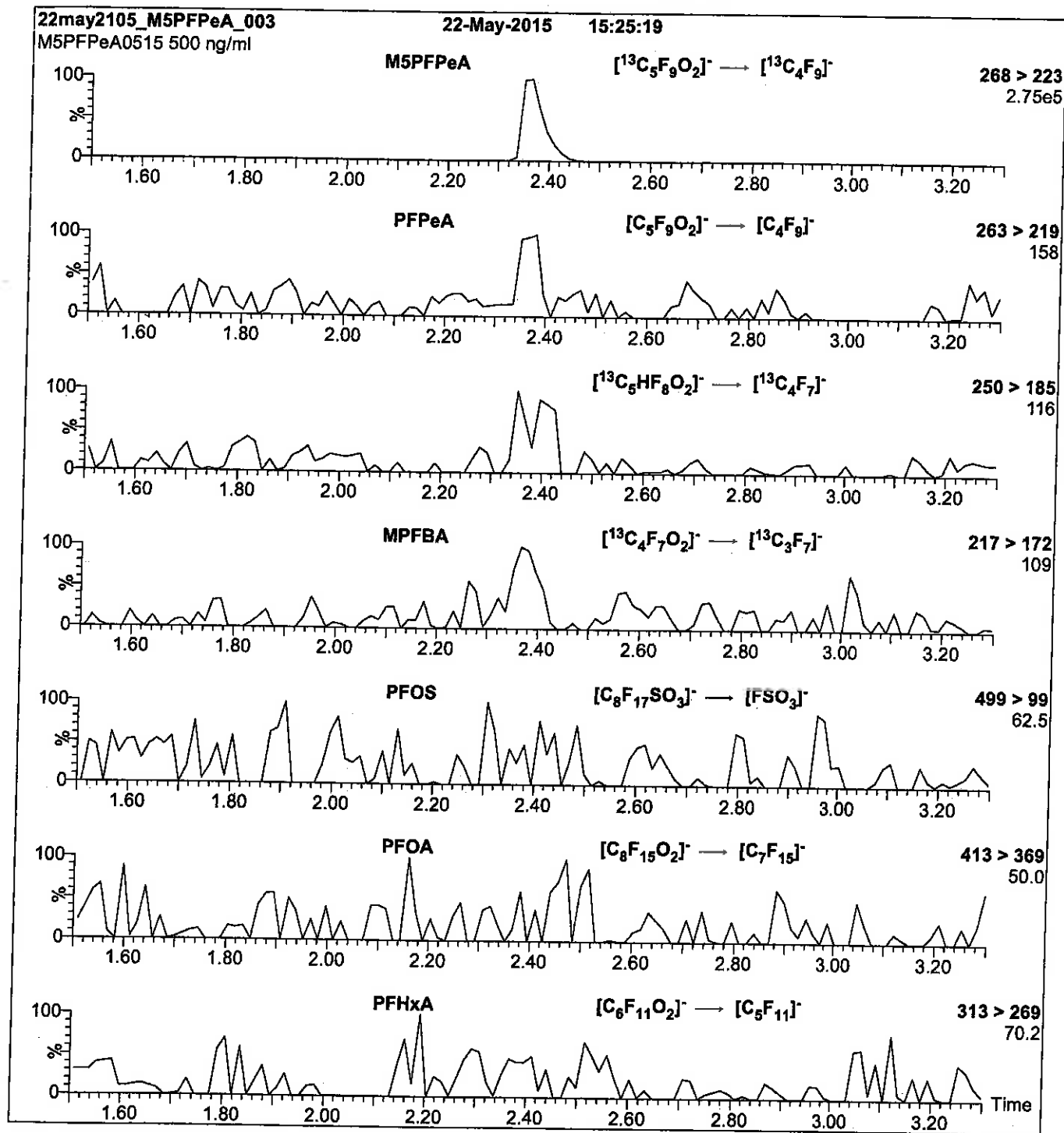
**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 750



**Figure 2: M5PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M5PFPeA)

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) =  $3.35\text{e-}3$   
Collision Energy (eV) = 9

Reagent

---

**LCM8FOSA\_00011**



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION



739615

ID: LCM8FOSA\_00011

Exp: 12/22/17 Prod: SBC  
13C8-Perfluorooctanesulfo

R: SBC 9/22/16  
Scanned 10/14/16

**PRODUCT CODE:**

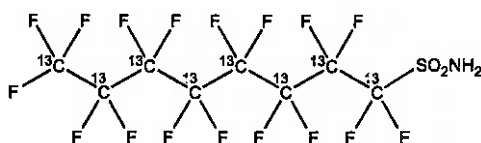
M8FOSA-I

**LOT NUMBER:**

M8FOSA1215I

**COMPOUND:**Perfluoro-1-[<sup>13</sup>C<sub>8</sub>]octanesulfonamide**STRUCTURE:****CAS #:**

Not available

**MOLECULAR FORMULA:**<sup>13</sup>C<sub>8</sub>H<sub>2</sub>F<sub>17</sub>NO<sub>2</sub>S**CONCENTRATION:**

50 ± 2.5 µg/ml

**CHEMICAL PURITY:**

&gt;98%

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

12/22/2015

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

12/22/2017

**RECOMMENDED STORAGE:**

Refrigerate ampoule

**MOLECULAR WEIGHT:**

507.09

**SOLVENT(S):**

Isopropanol

**ISOTOPIC PURITY:**≥99% <sup>13</sup>C  
(<sup>13</sup>C<sub>8</sub>)**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.

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

Certified By:

  
B.G. Chittim

Date: 01/14/2016

(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.

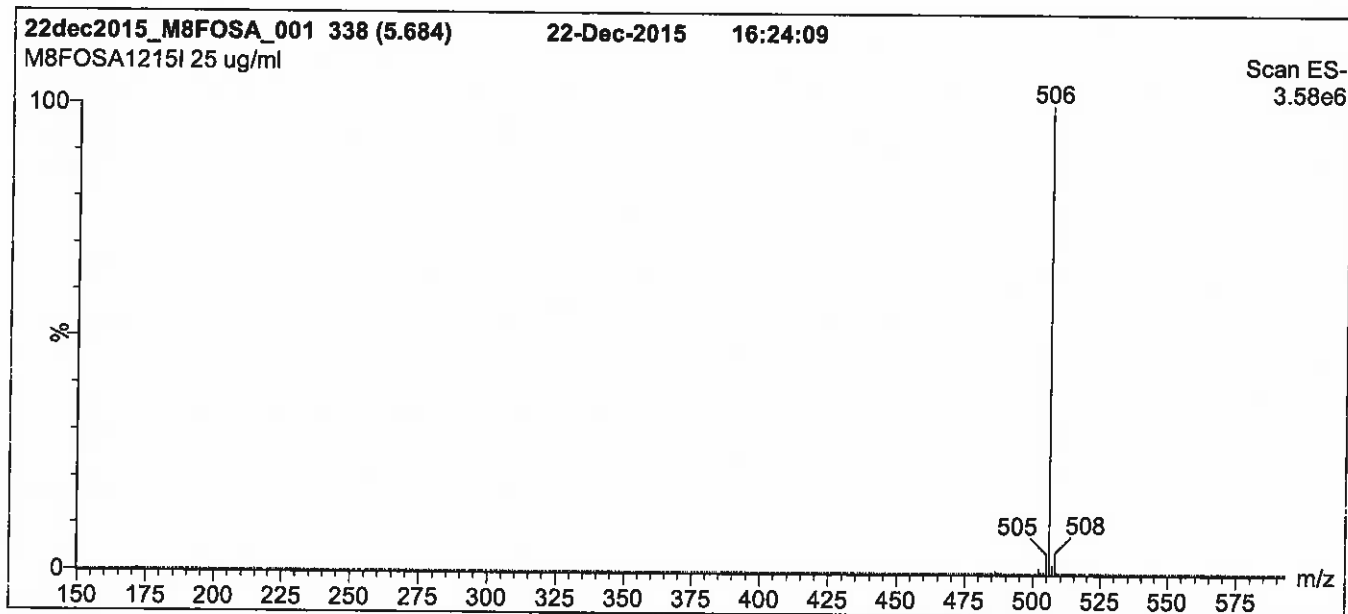
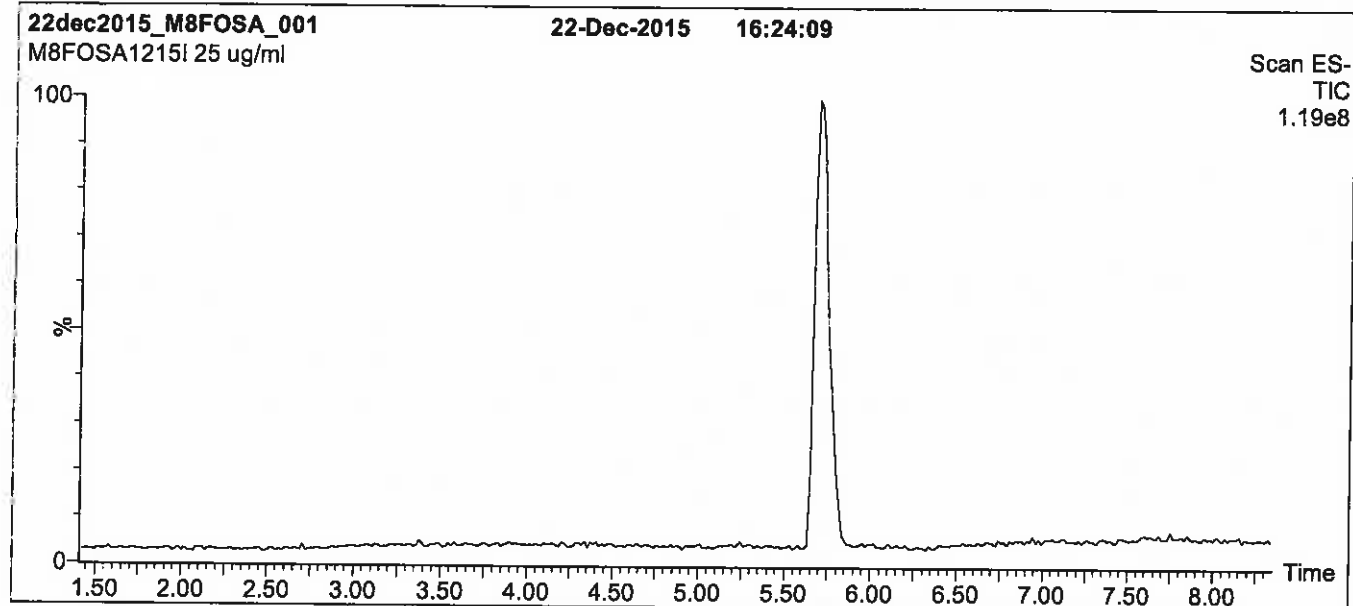
**QUALITY MANAGEMENT:**

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:** M8FOSA-I; 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

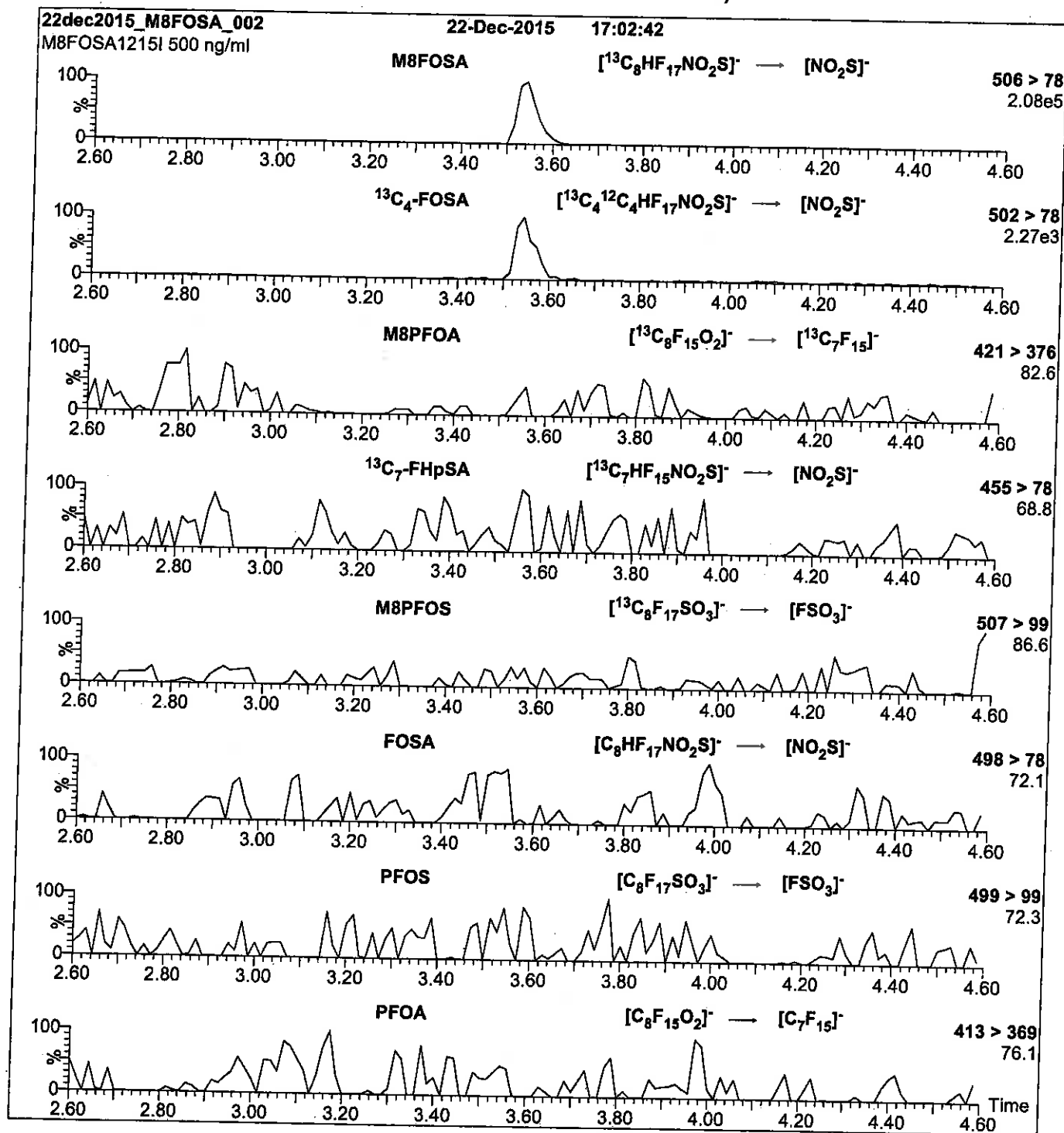
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.50  
Cone Voltage (V) = 40.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M8FOSA-I)

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) = 3.39e-3  
Collision Energy (eV) = 30

Reagent

---

**LCMPFBA\_00008**

R: 8BC 9/22/16



739593

ID: LCMFBA\_00008

Exp: 05/24/21 Prod: SEC

13C4-Perfluorobutanoic ac



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SP

**PRODUCT CODE:**

MPFBA

**LOT NUMBER:**

MPFBA0516

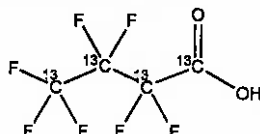
**COMPOUND:**

Perfluoro-n-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]butanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>4</sub>HF<sub>9</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:**

218.01

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99%<sup>13</sup>C

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

05/24/2016

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

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

05/24/2021

**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:** 05/30/2016

(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.

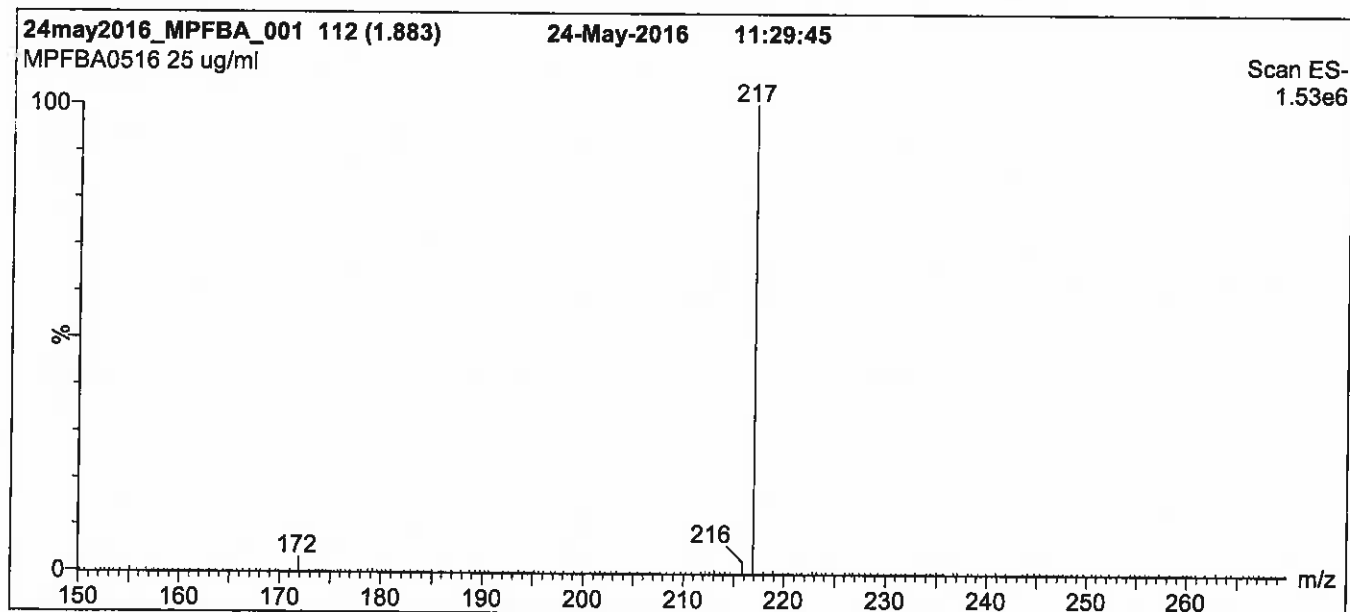
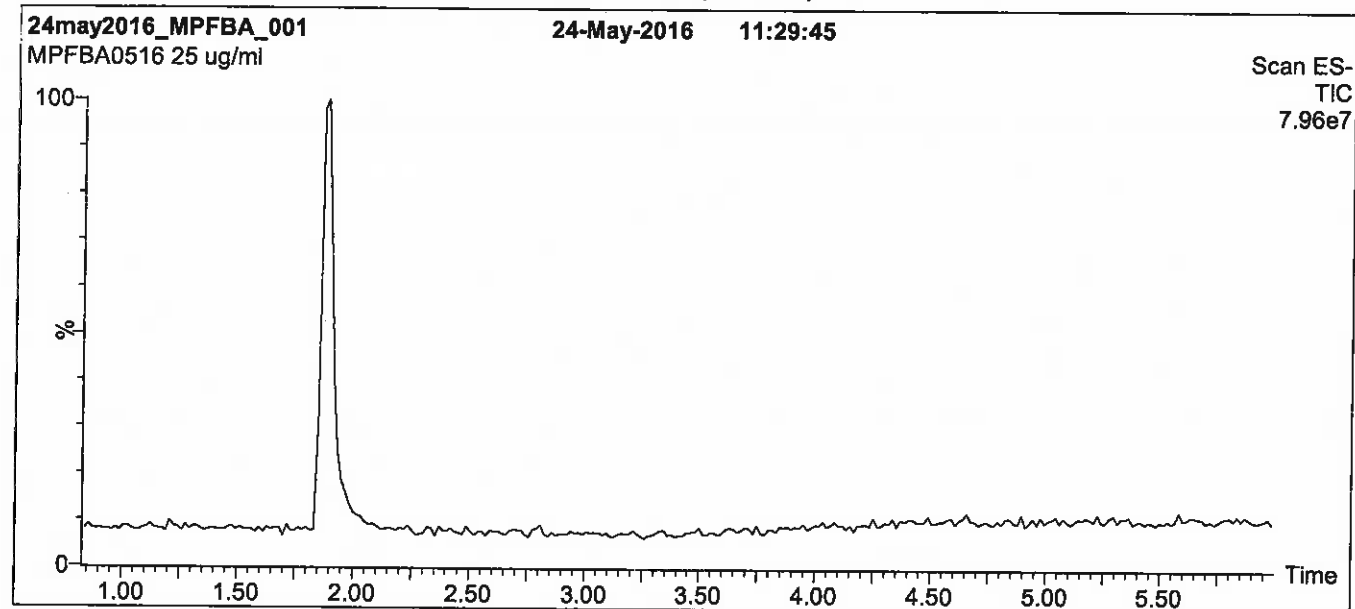
**QUALITY MANAGEMENT:**

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: MPFBA; 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: 30% (80:20 MeOH:ACN) / 70% 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

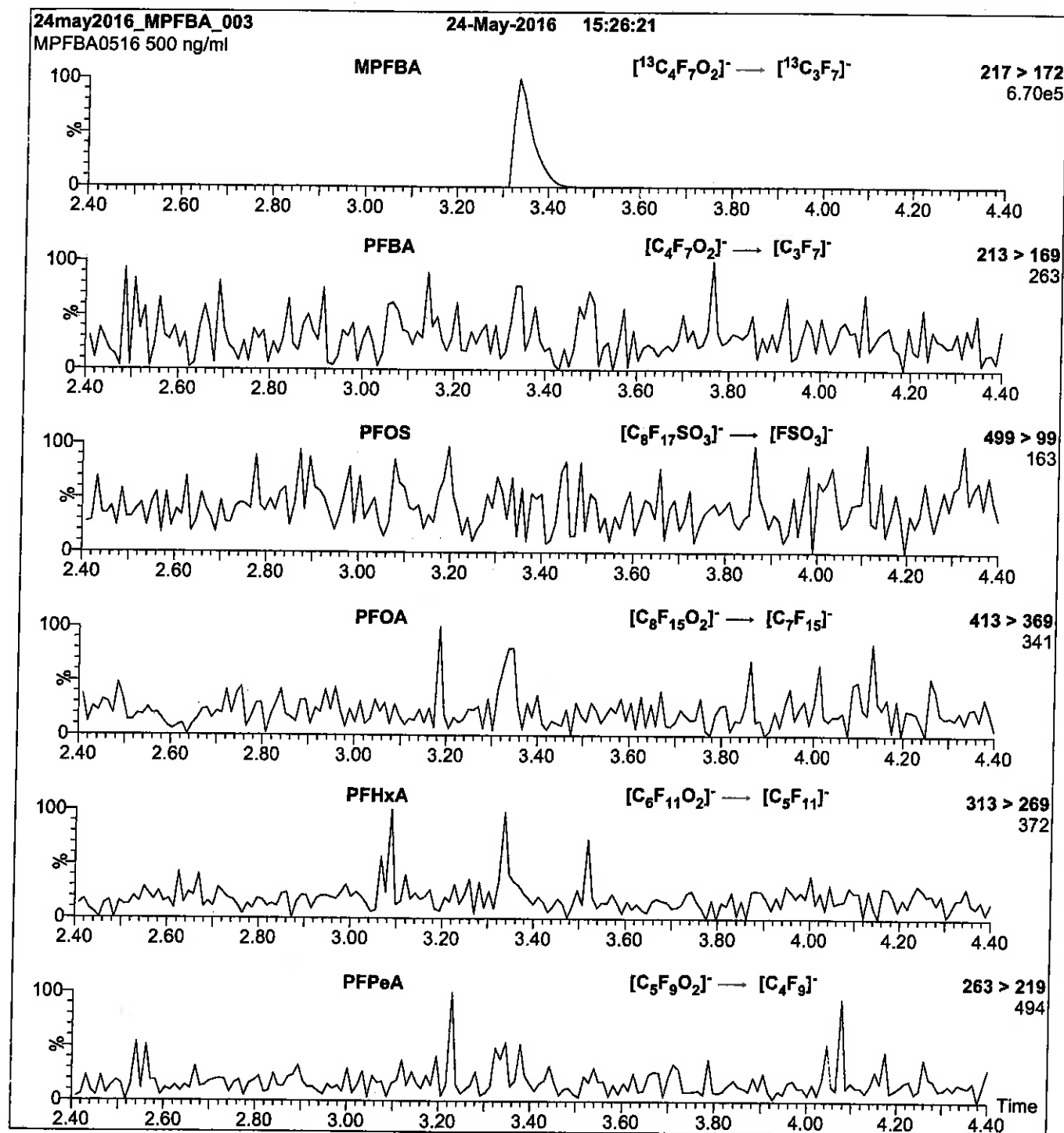
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 10.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.50e-3  
Collision Energy (eV) = 10

Reagent

---

**LCMPFBS\_00001**

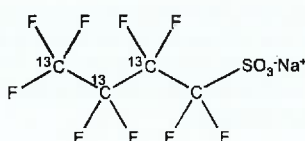
7:5/11/16 SKV



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** M3PFBS **LOT NUMBER:** M3PFBS0815  
**COMPOUND:** Sodium perfluoro-1-[2,3,4-<sup>13</sup>C<sub>3</sub>]butanesulfonate  
**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>3</sub><sup>12</sup>CF<sub>9</sub>SO<sub>3</sub>Na **MOLECULAR WEIGHT:** 325.06  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol  
 46.5 ± 2.3 µg/ml (M3PFBS anion)  
**CHEMICAL PURITY:** >98% **ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
**LAST TESTED:** (mm/dd/yyyy) 08/20/2015 (2,3,4-<sup>13</sup>C<sub>3</sub>)  
**EXPIRY DATE:** (mm/dd/yyyy) 08/20/2020  
**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.

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

Certified By:

B.G. Chittim

Date: 08/20/2015  
(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.

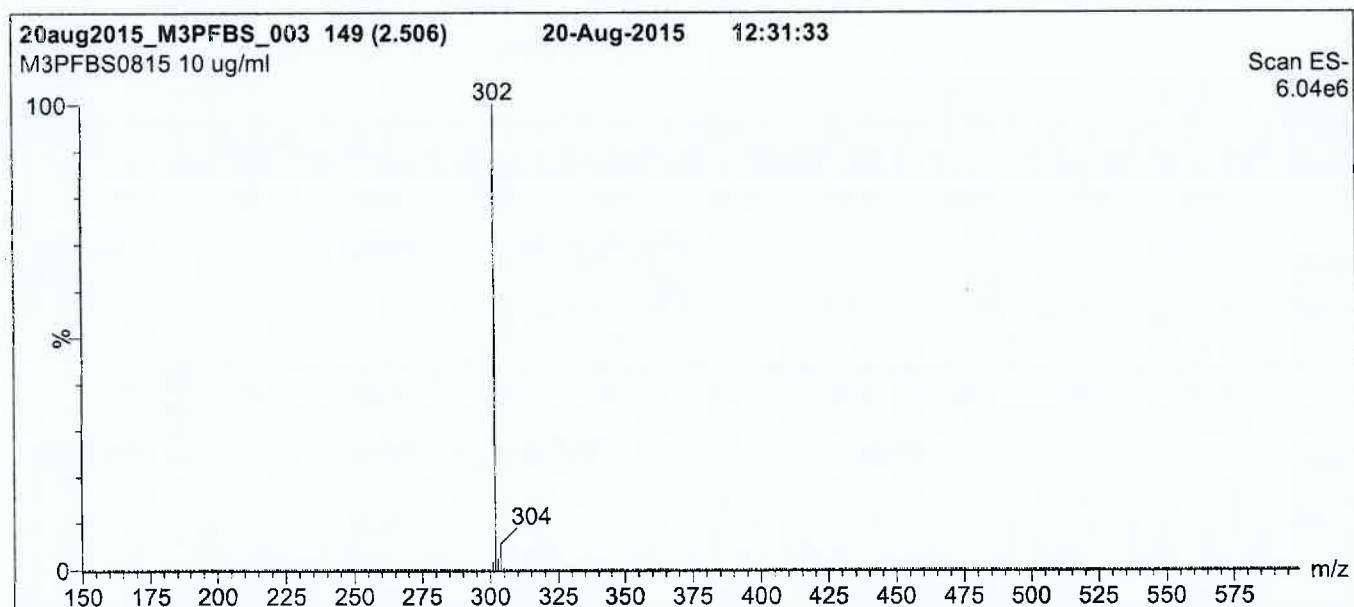
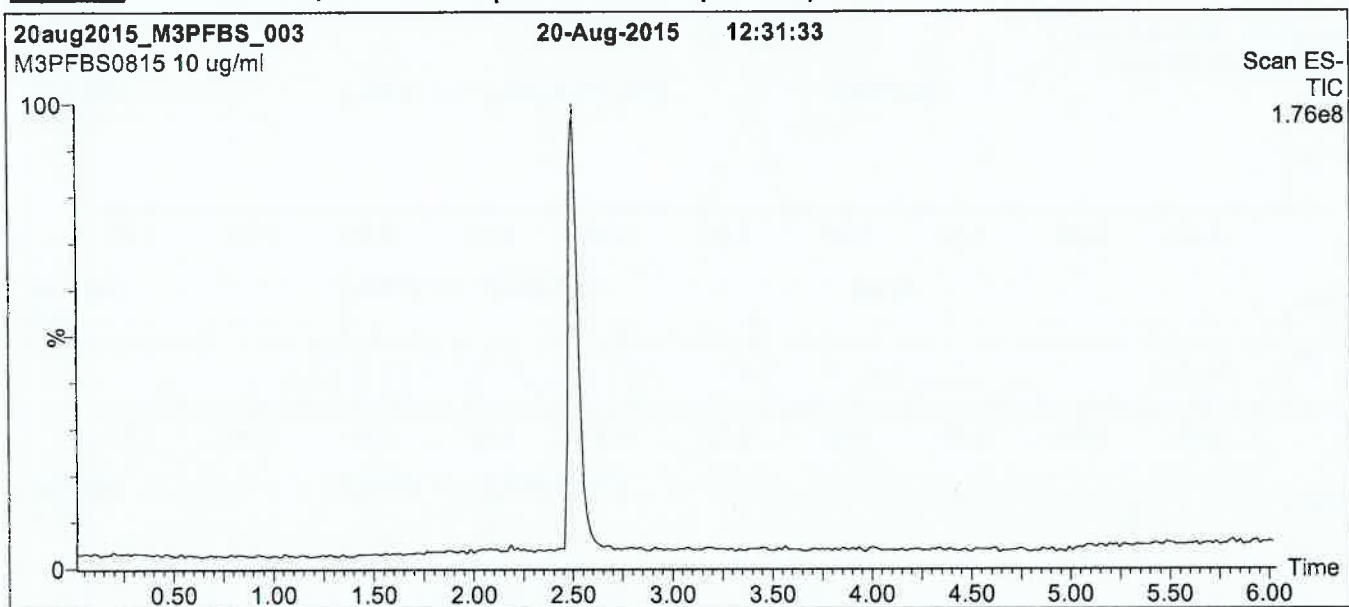
### **QUALITY MANAGEMENT:**

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: M3PFBS; 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

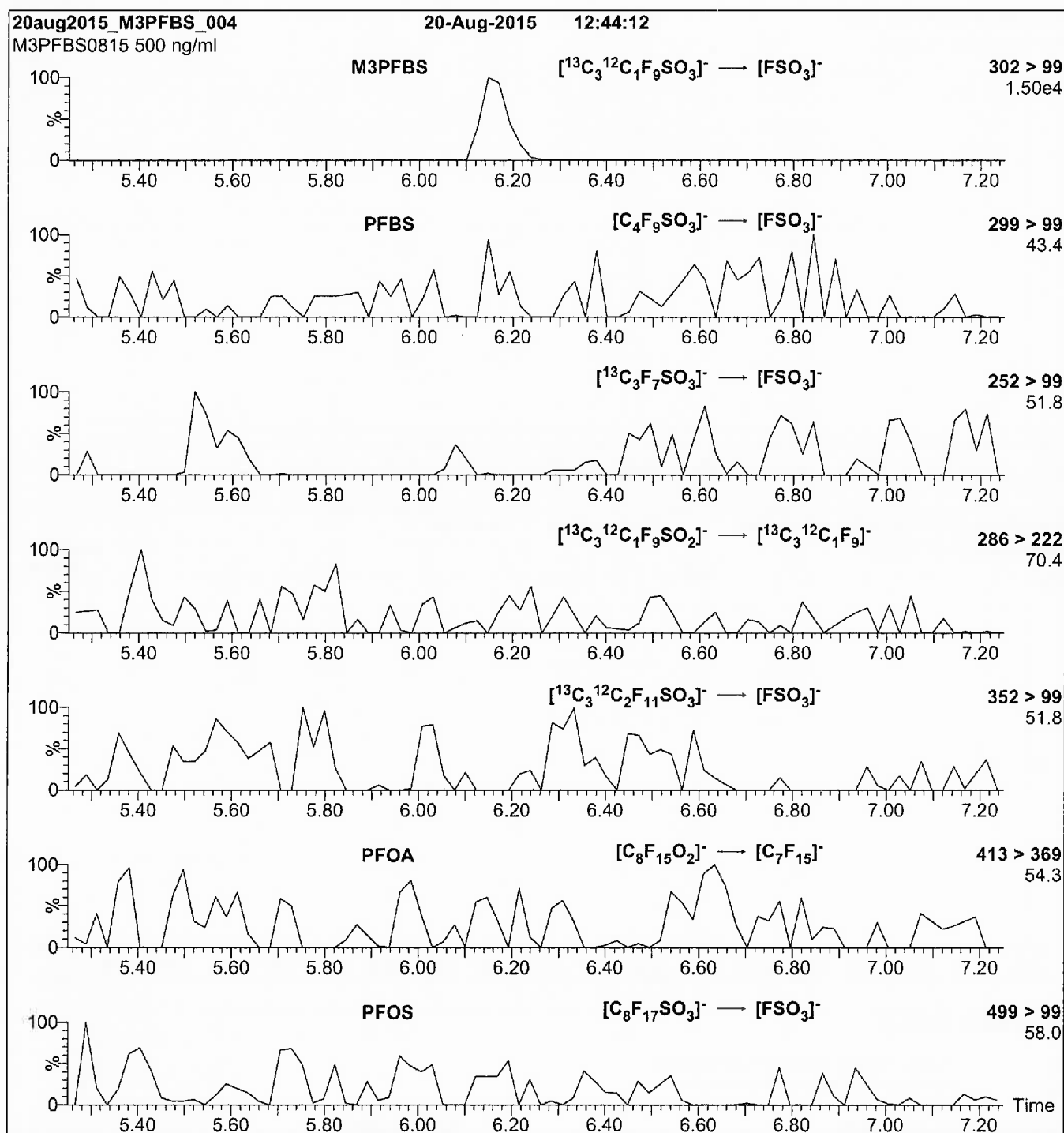
Flow: 300  $\mu$ l/min

**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: M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M3PFBS)

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) = 3.31e-3  
Collision Energy (eV) = 25



Reagent

---

**LCMPFDA\_00011**



Scanned 10/14/16 R: SBC 9/22/16  
WELLINGTON  
LABORATORIES

CERTIFICATE OF ANALYSIS  
DOCUMENTATION

739609  
ID: LCMFDA\_00011  
Exp: 08/19/20 Prep: SBC  
13C2-Perfluorodecanoic a

**PRODUCT CODE:**

MPFDA

**LOT NUMBER:**

MPFDA0815

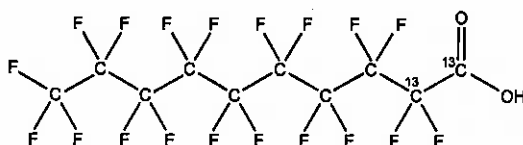
**COMPOUND:**

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

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>HF<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

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

08/19/2015

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

08/19/2020

**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: 08/21/2015

(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.

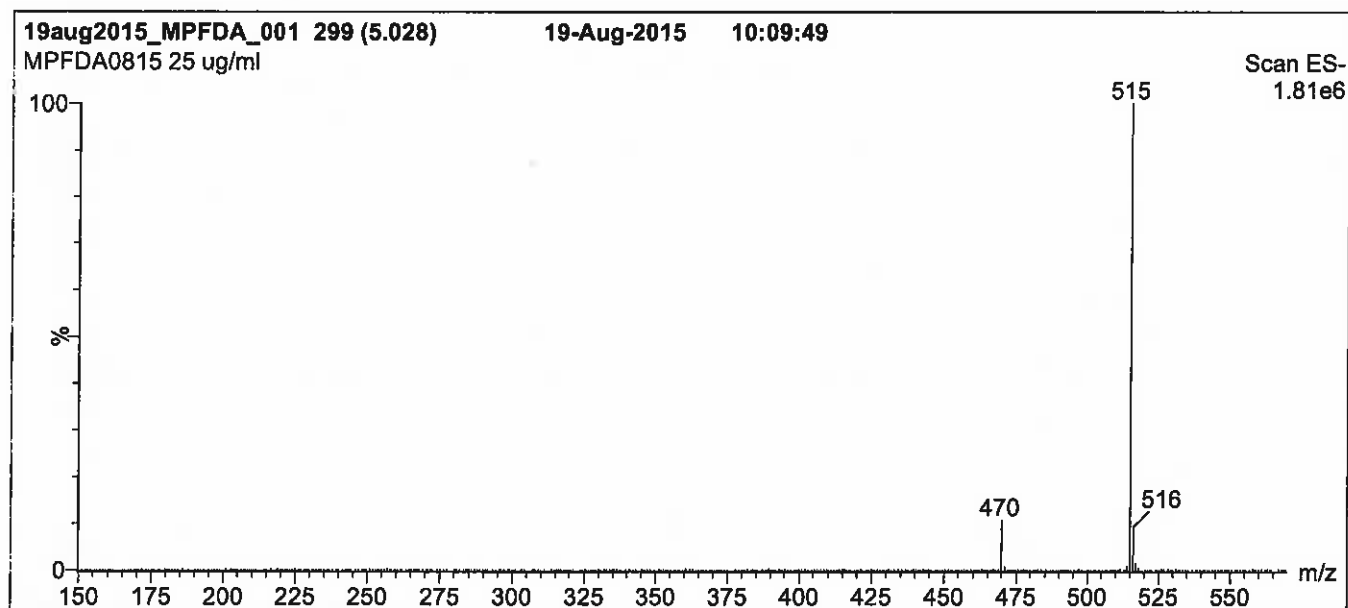
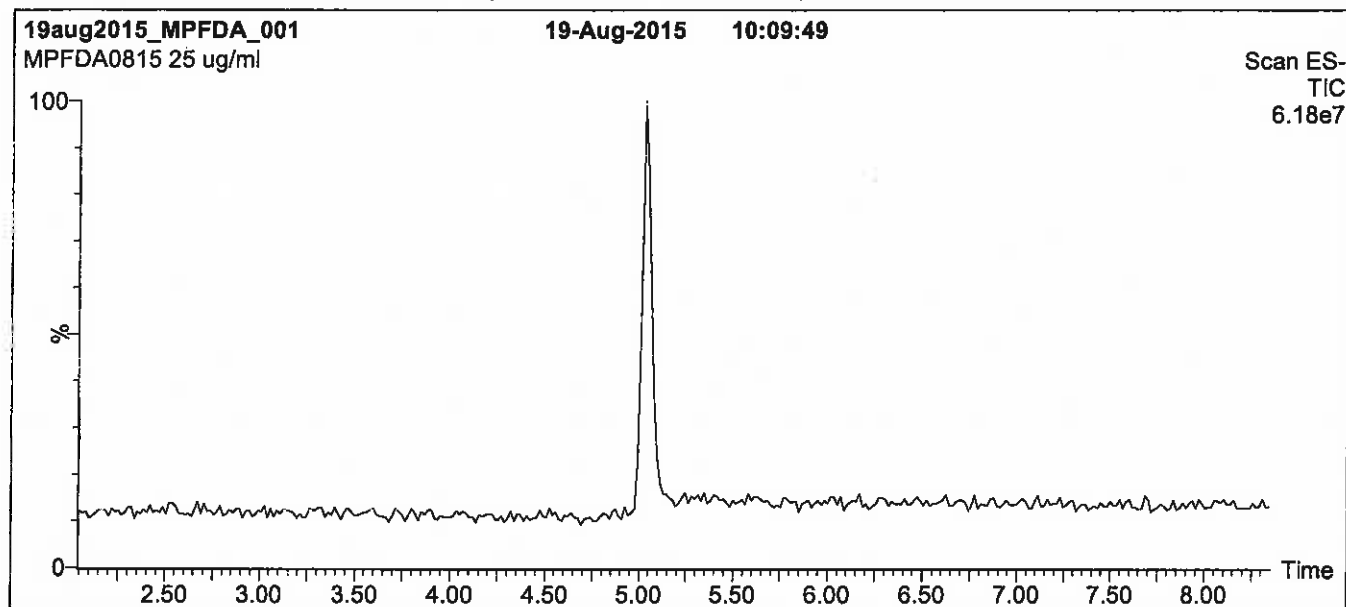
**QUALITY MANAGEMENT:**

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 2 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

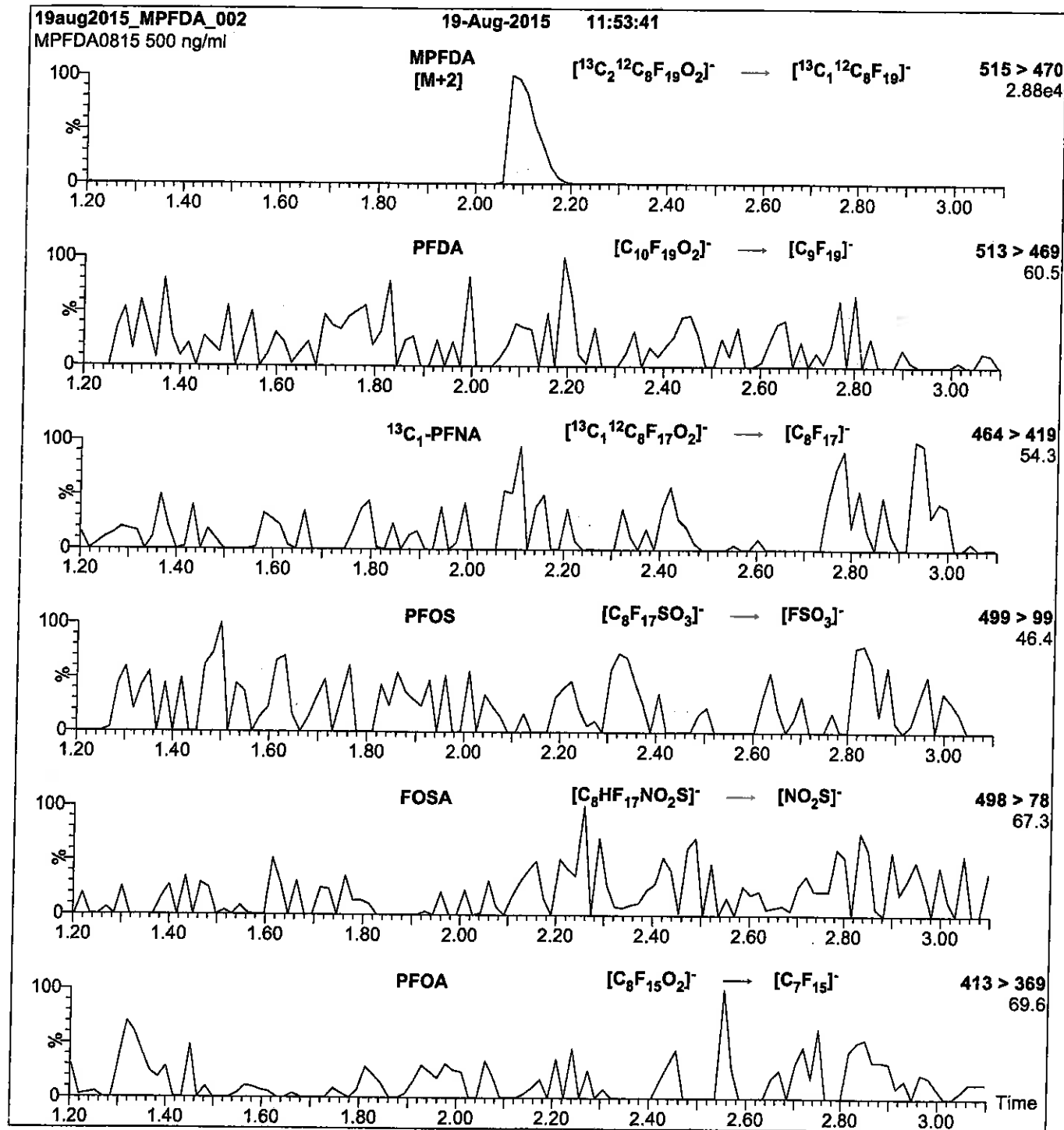
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 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%  $H_2O$   
(both with 10 mM  $NH_4OAc$  buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.35e-3  
Collision Energy (eV) = 13

Reagent

---

**LCMPFD<sub>o</sub>A\_00008**

R: gbe 9/22/16



739598

ID: LCMFDoA\_00008

Exp: 04/08/21 Prod: SBC

13C2-Perfluorododecanoic



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SR

**PRODUCT CODE:**

MPFDoA

**LOT NUMBER:**

MPFDoA0416

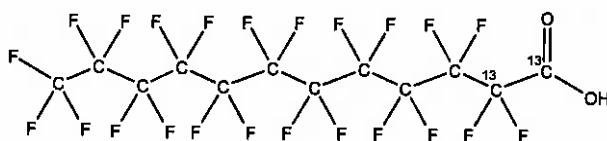
**COMPOUND:**

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

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>10</sub>HF<sub>23</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

616.08

**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)

04/08/2016

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

04/08/2021

**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: 04/15/2016

(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:**

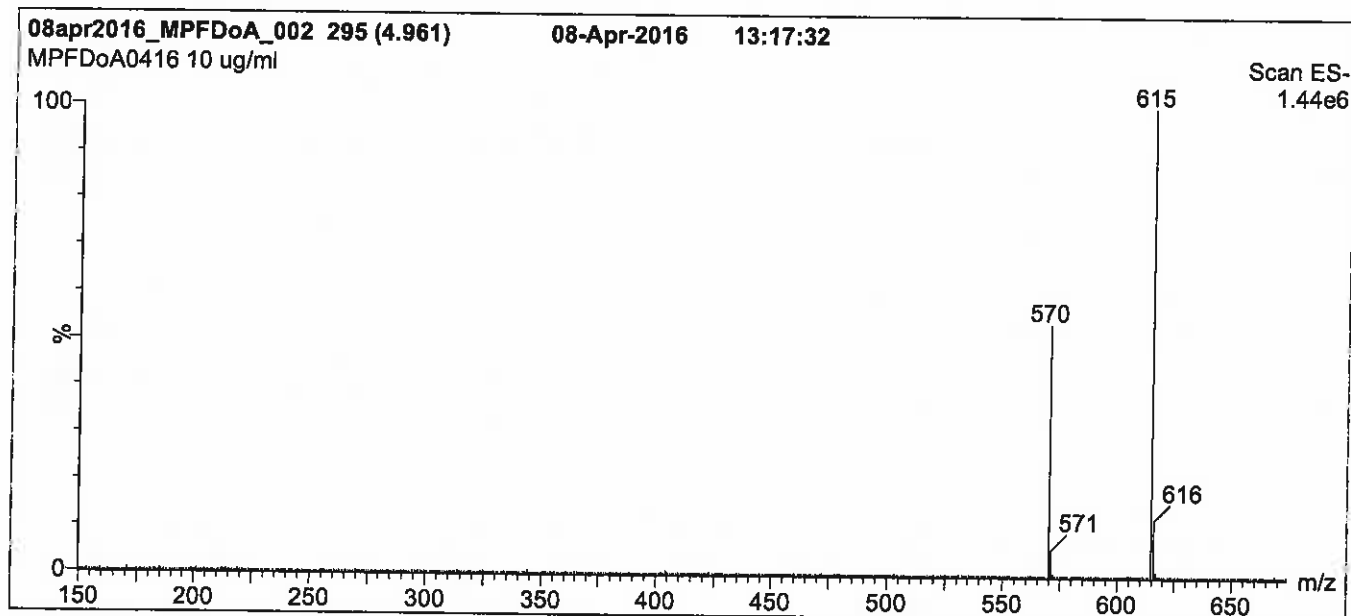
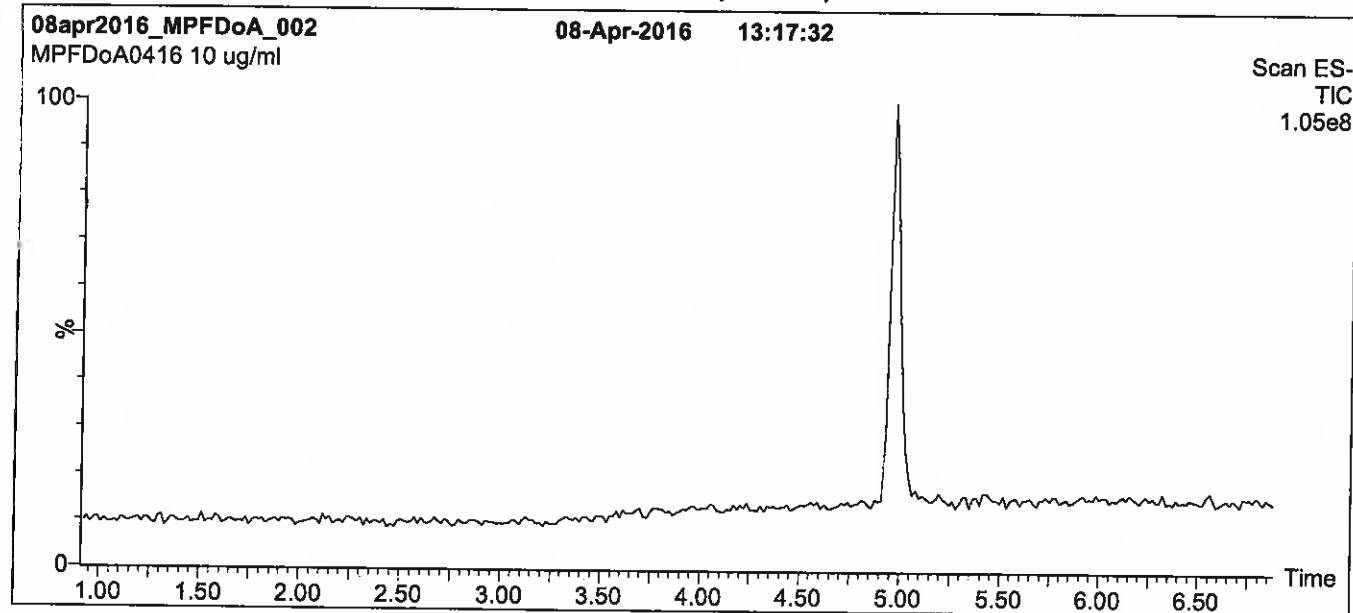
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*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: MPFDoA; 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: 60% (80:20 MeOH:ACN) / 40% 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

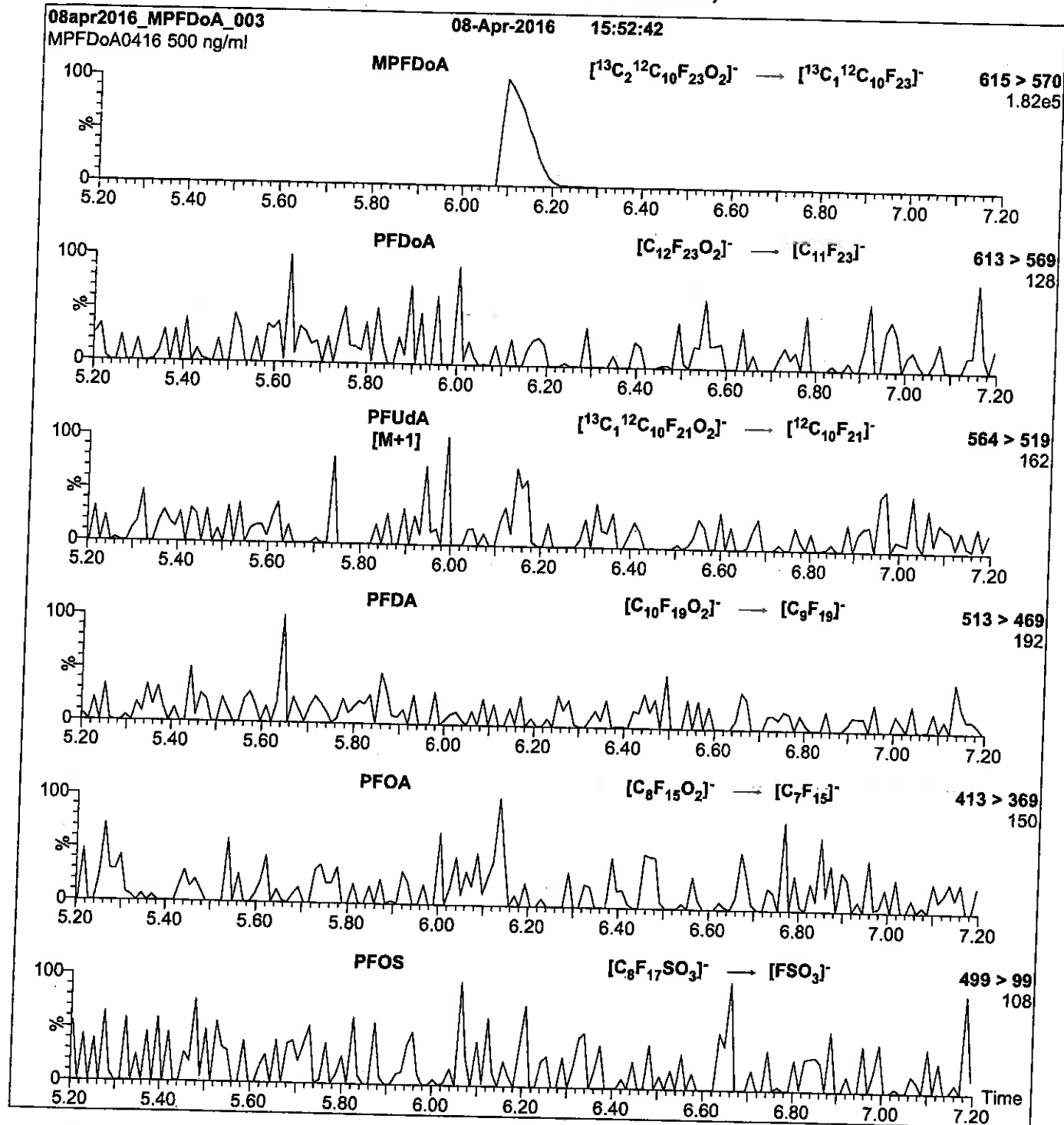
**Flow:** 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 20.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.24e-3  
 Collision Energy (eV) = 13

Reagent

---

**LCMPFHxA\_00012**

Scanned 10/14/16 R: SBC 9/22/16

739612  
ID: LCMFHA\_00012  
Exp: 04/08/21 Prep: SBC  
13C2-Perfluorohexanoic ac



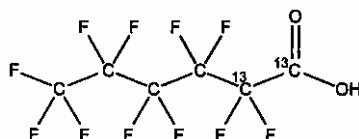
# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

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

**LOT NUMBER:** MPFHxA0416

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

**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 04/08/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 04/08/2021  
**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:** 04/29/2016  
(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:**

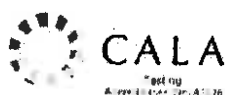
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **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.

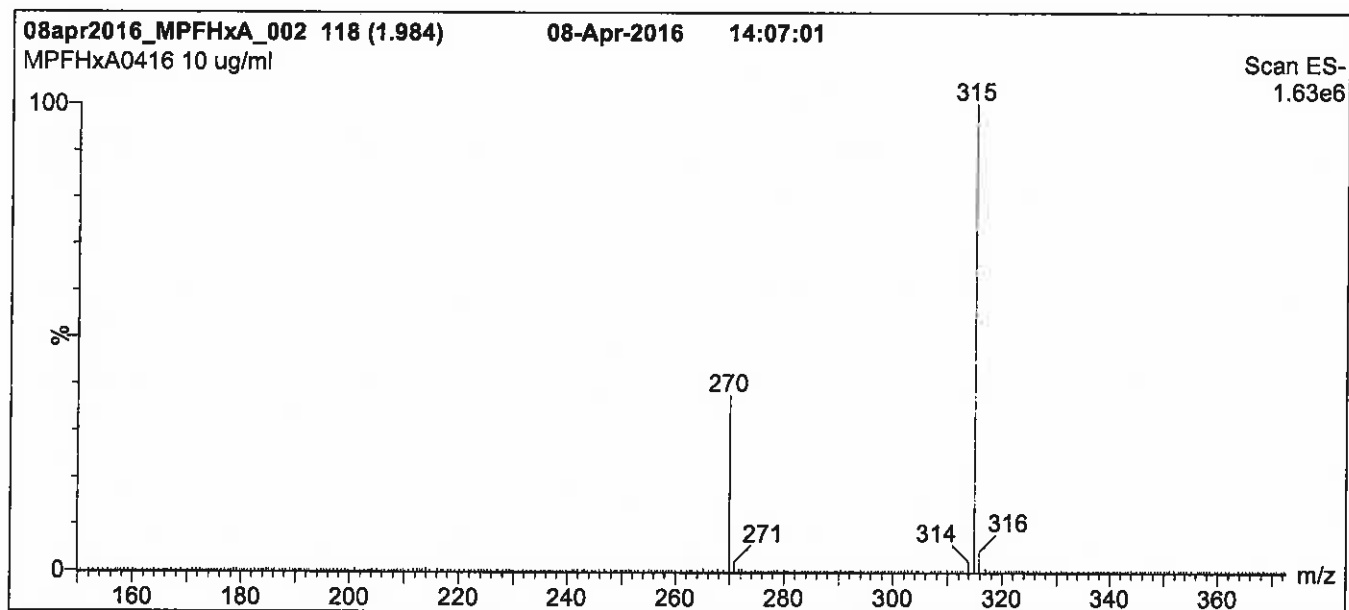
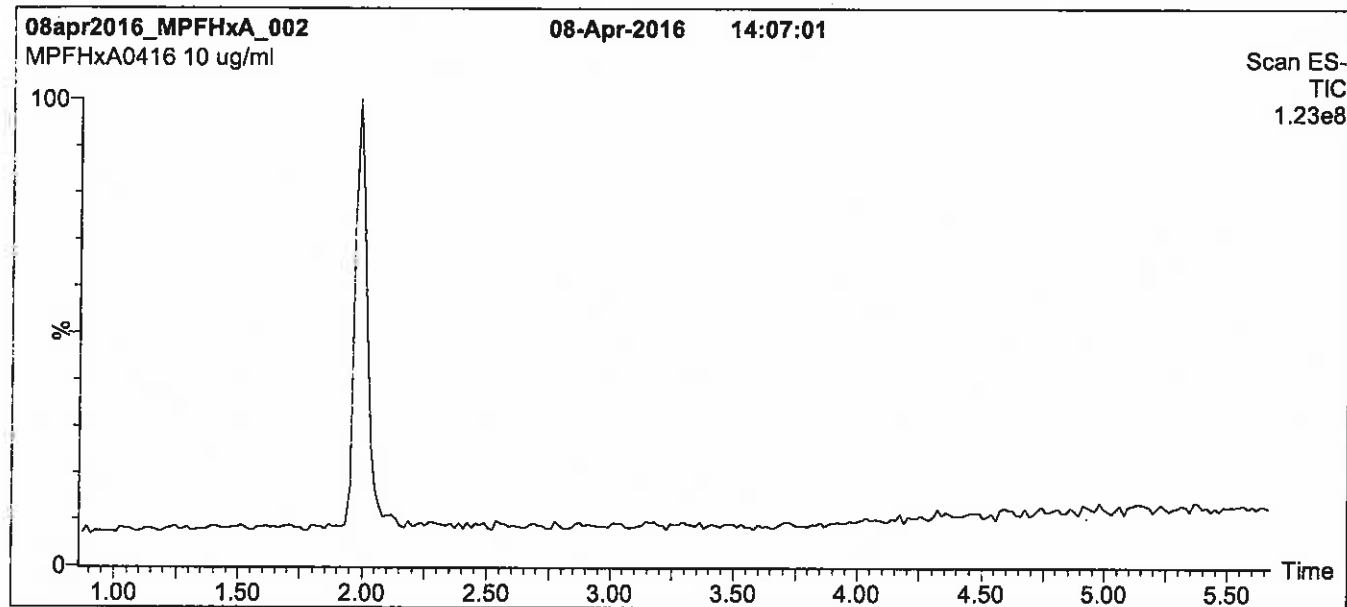
### **QUALITY MANAGEMENT:**

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: 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: 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 over 0.5 min.

Time: 10 min

Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)

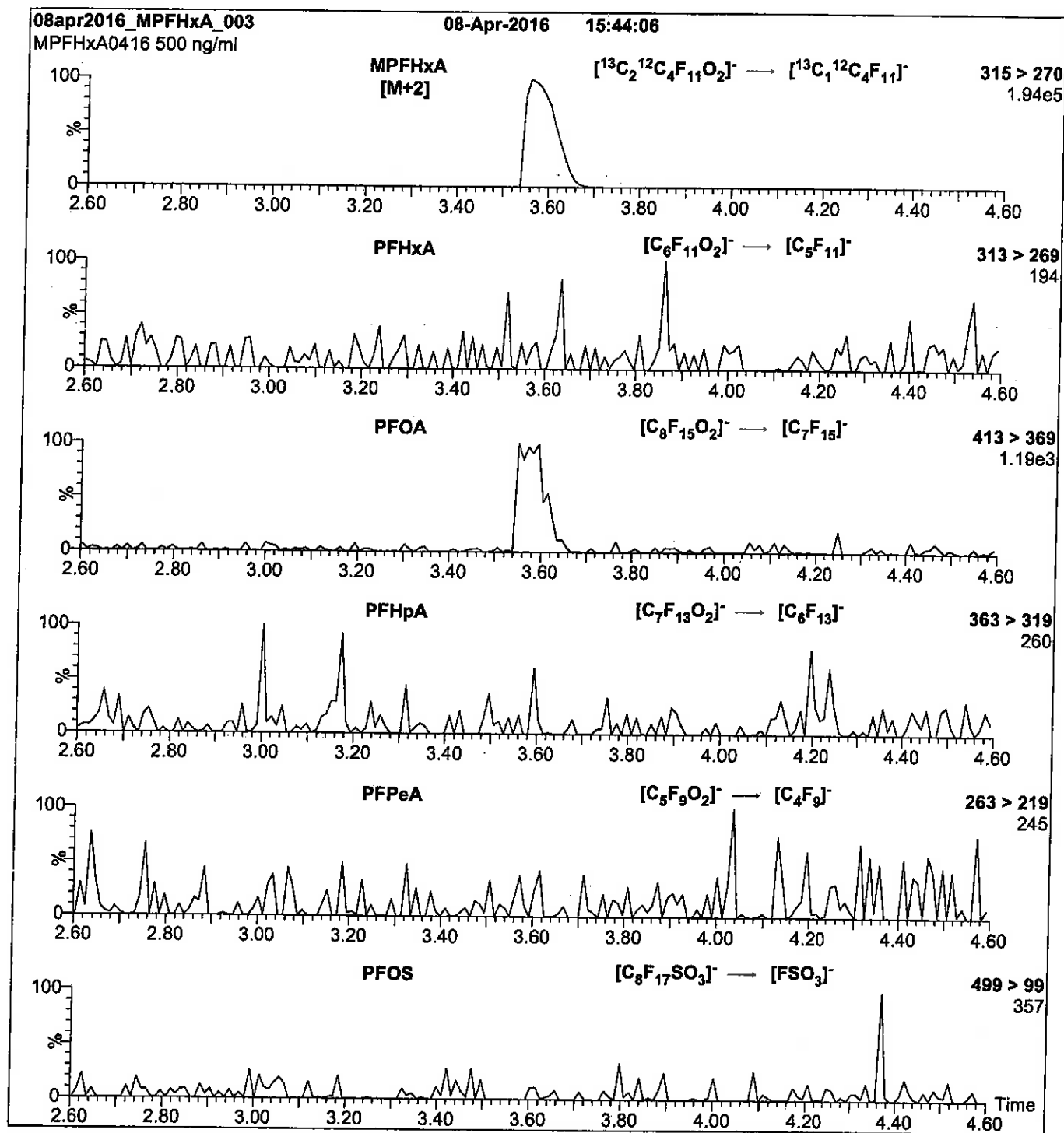
Capillary Voltage (kV) = 2.00

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  $\mu\text{l}$  (500 ng/ml MPFHxA)

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) = 3.39e-3  
Collision Energy (eV) = 10

Reagent

---

**LCMPFHxS\_00008**



f: 8BC 9/22/16



739601

ID: LCMPFHxS\_00008

Exp: 10/23/20 Prod: SBC

18O2-Perfluorohexanesulfo



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SK

**PRODUCT CODE:**

MPFHxS

**LOT NUMBER:**

MPFHxS1015

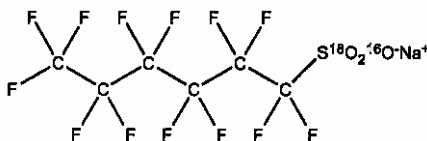
**COMPOUND:**

Sodium perfluoro-1-hexane[<sup>18</sup>O<sub>2</sub>]sulfonate

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

C<sub>6</sub>F<sub>13</sub>S<sup>18</sup>O<sub>2</sub><sup>16</sup>ONa

**MOLECULAR WEIGHT:**

426.10

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

**SOLVENT(S):**

Methanol

47.3 ± 2.4 µg/ml (MPFHxS anion)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

>94% (<sup>18</sup>O<sub>2</sub>)

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

10/23/2015

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

10/23/2020

**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.
- The response factor for MPFHxS (C<sub>6</sub>F<sub>13</sub>S<sup>18</sup>O<sub>2</sub><sup>16</sup>O<sup>-</sup>) has been observed to be up to 10% lower than for PFHxS (C<sub>6</sub>F<sub>13</sub>S<sup>18</sup>O<sub>3</sub><sup>-</sup>) when both compounds are injected together. This difference may vary between instruments.
- Due to the isotopic purity of the starting material (<sup>18</sup>O<sub>2</sub> >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

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

Certified By:

B.G. Chittim

Date: 10/28/2015

(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.

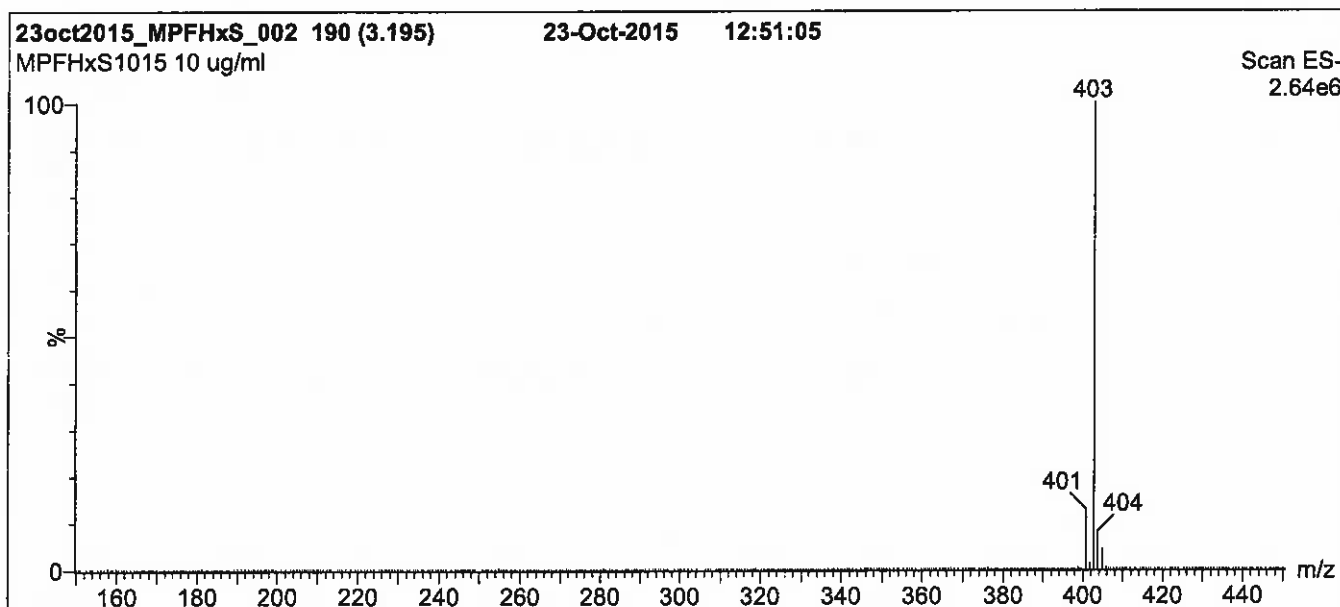
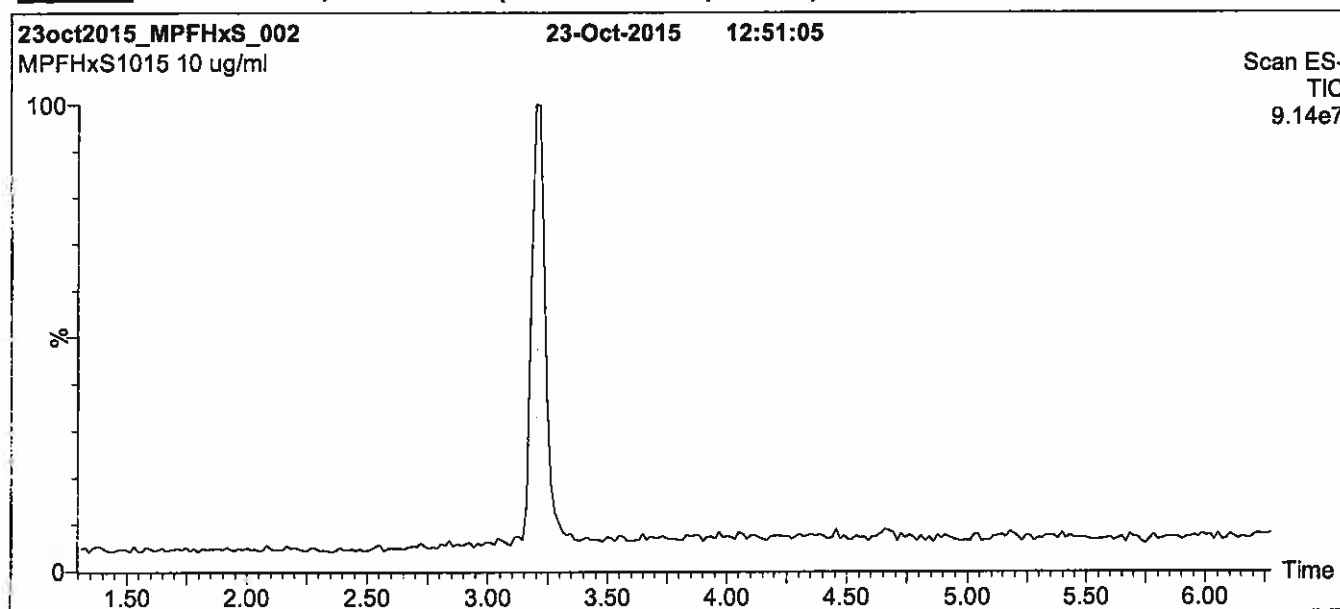
**QUALITY MANAGEMENT:**

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: MPFHxS; 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

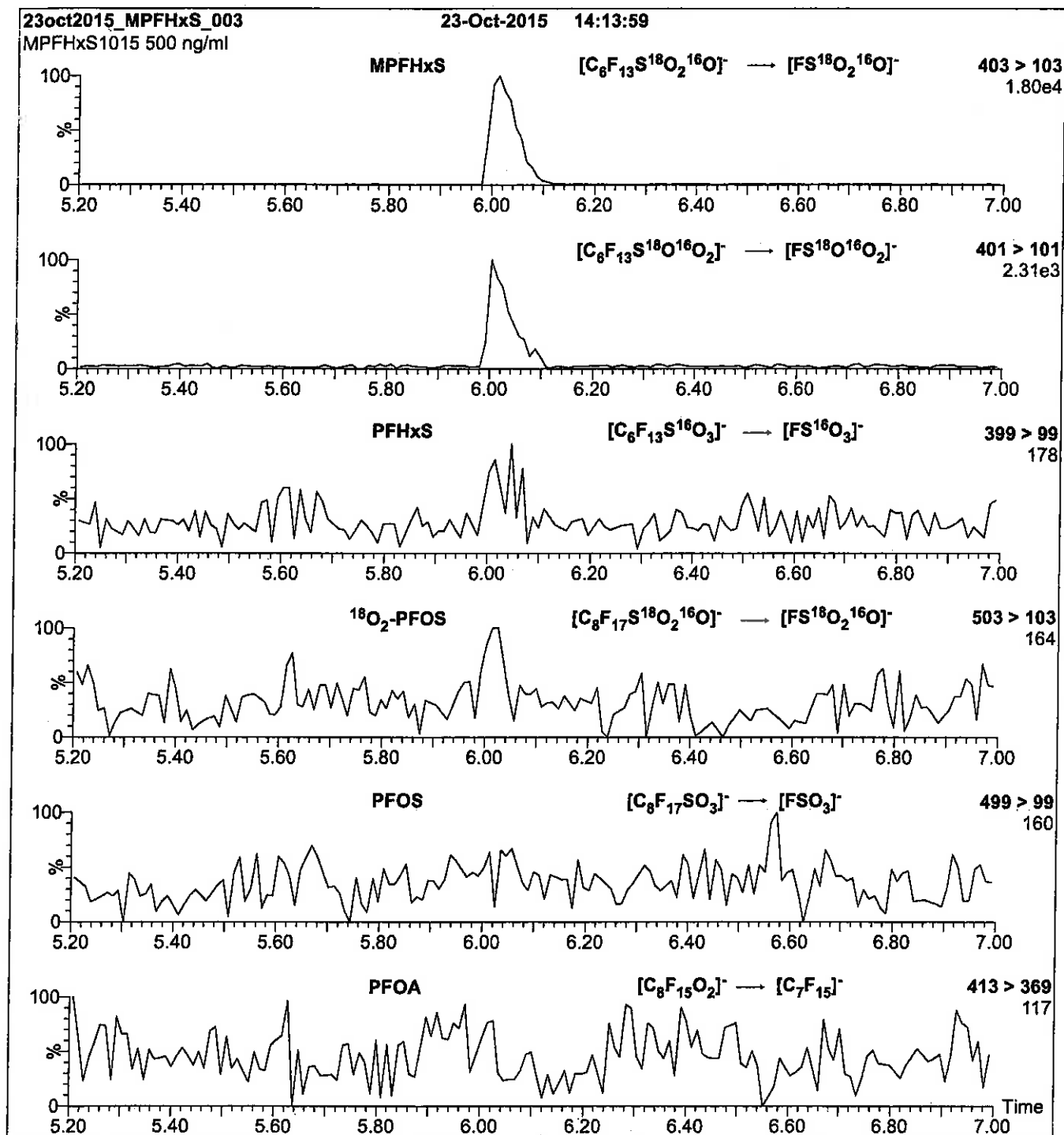
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 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: MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

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

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

Reagent

---

**LCMPFNA\_00008**

Scanned 10/14/16 R: SBC 9/22/16

739637  
ID: LCM:PFNA\_00008  
Exp: 04/13/19 Prod: SBC  
13C5-Perfluorononanoic acid



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFNA

**LOT NUMBER:**

MPFNA0414

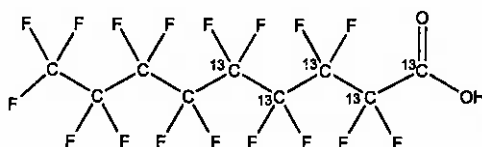
**COMPOUND:**

Perfluoro-n-[1,2,3,4,5-<sup>13</sup>C<sub>5</sub>]nonanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>5</sub><sup>12</sup>C<sub>4</sub>HF<sub>17</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

469.04

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99%<sup>13</sup>C

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

04/13/2014

(1,2,3,4,5-<sup>13</sup>C<sub>5</sub>)

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

04/13/2019

**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: 04/01/2015

(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.

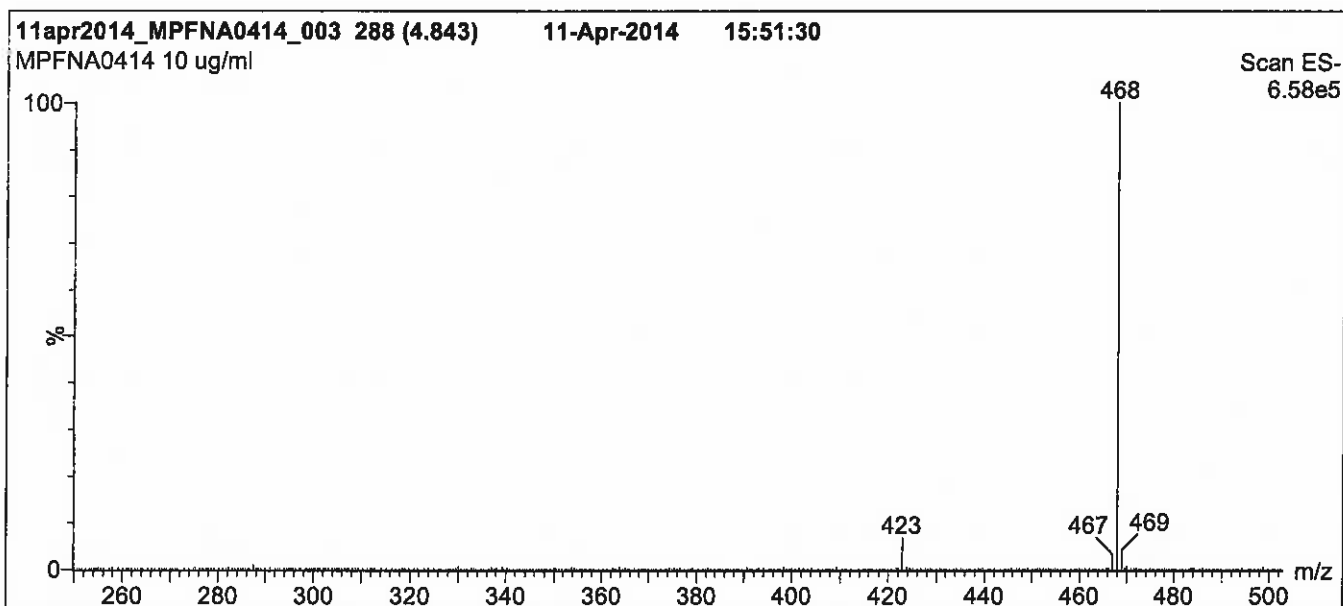
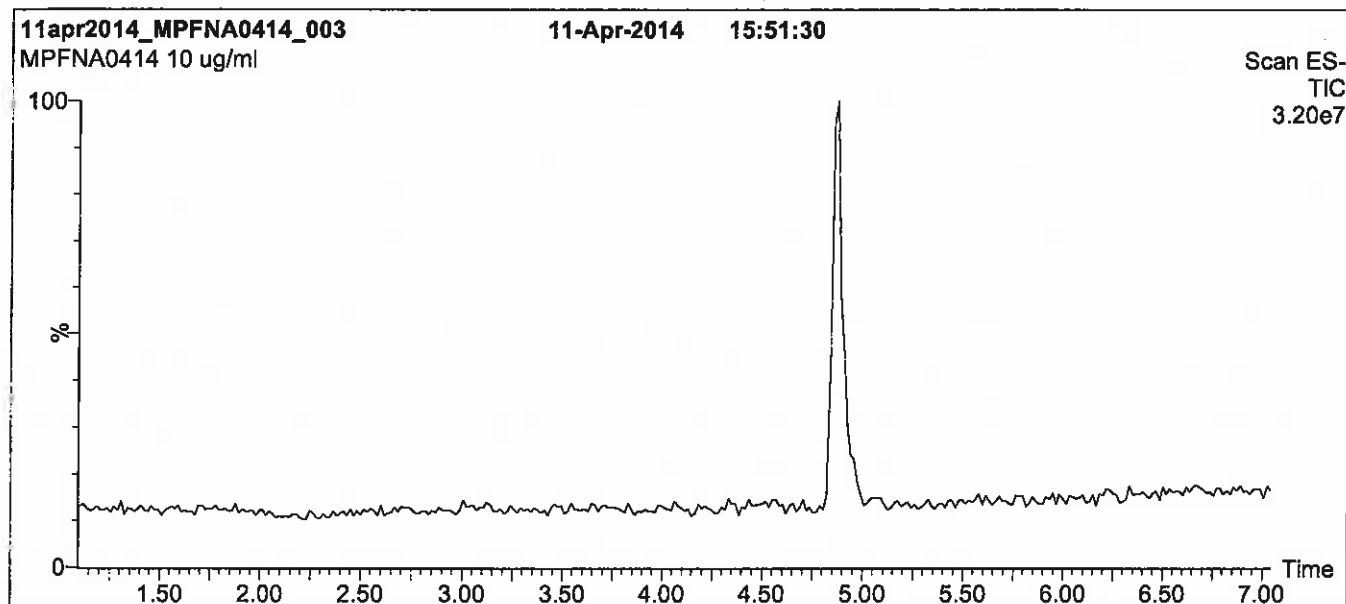
### **QUALITY MANAGEMENT:**

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: MPFNA; 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

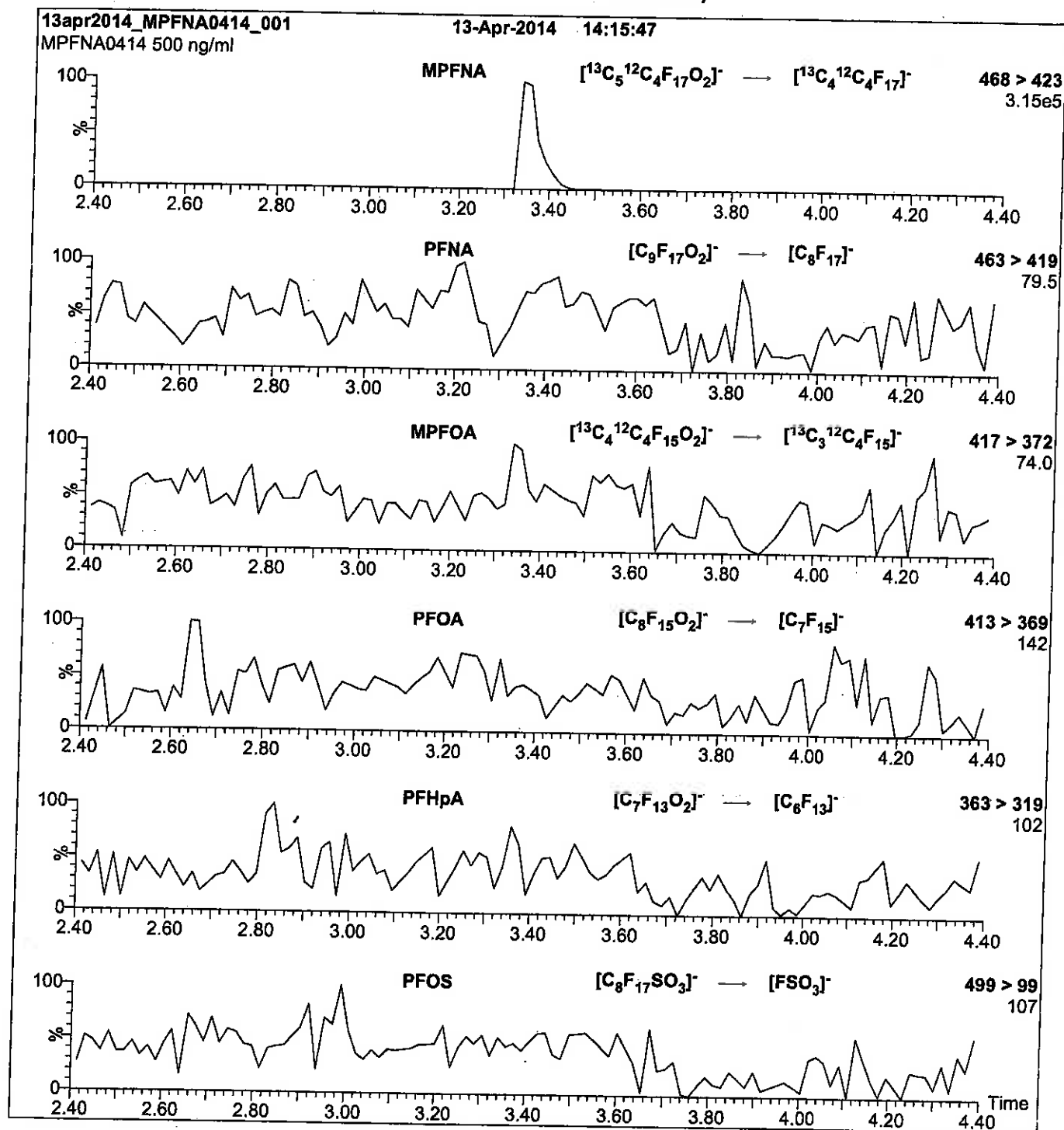
**MS Parameters**

Experiment: Full Scan (250 - 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: MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

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

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) = 3.28e-3  
Collision Energy (eV) = 11

Reagent

---

**LCMPFOA\_00012**

R: SBC 9/22/16



738683

ID: LCMFOA\_00012

Exp: 01/22/21 Prod: SBC  
13C4-Perfluorooctanoic ac



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFOA

**LOT NUMBER:**

MPFOA0116

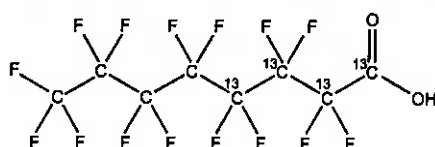
**COMPOUND:**

Perfluoro-n-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanoic acid

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>4</sub><sup>12</sup>C<sub>4</sub>HF<sub>15</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

418.04

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

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

01/22/2016

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

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

01/22/2021

**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 native perfluoro-n-octanoic acid (PFOA).

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

Certified By:

B.G. Chittim

Date: 02/01/2016

(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.

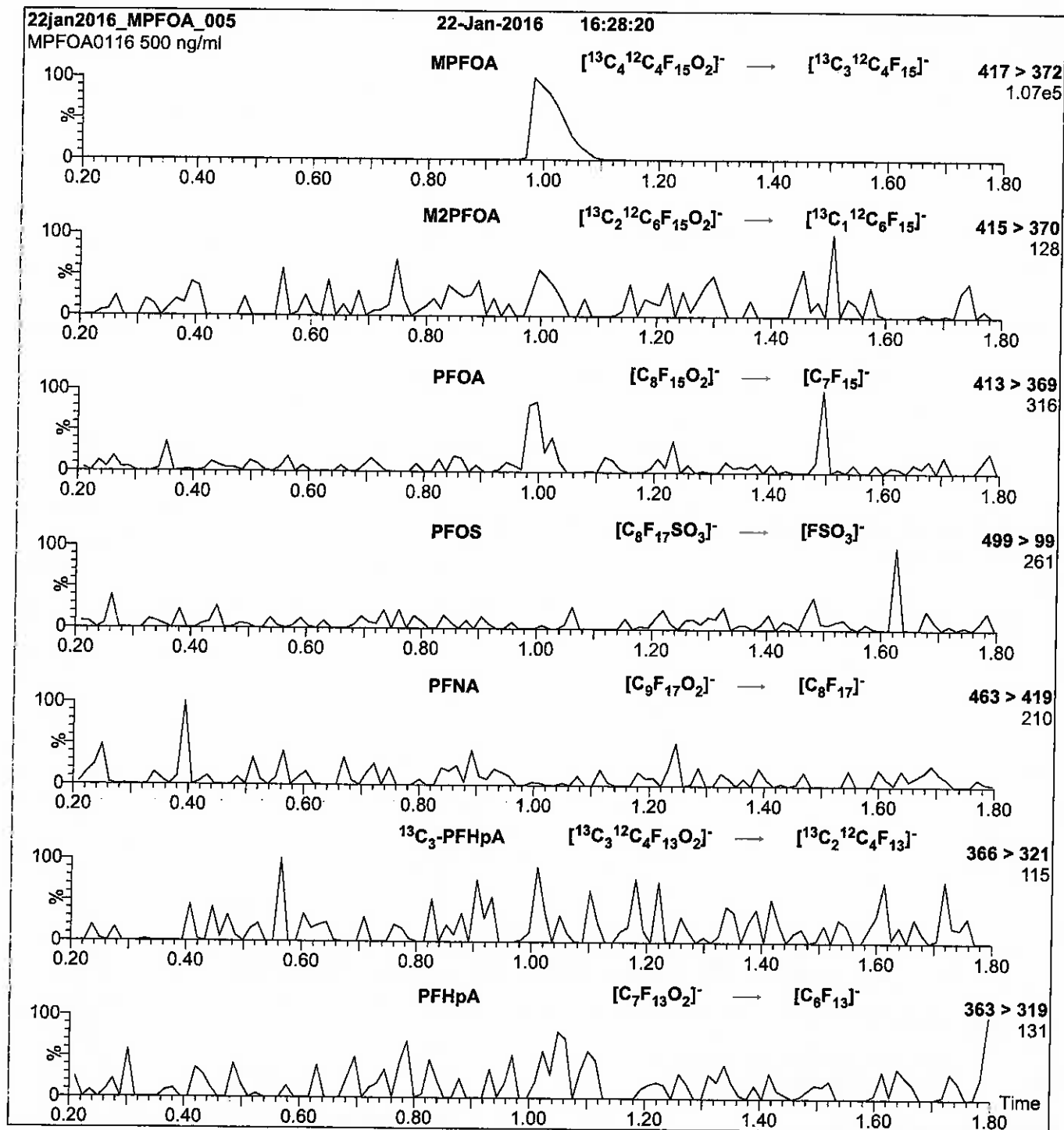
**QUALITY MANAGEMENT:**

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



**Conditions for Figure 2:**

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

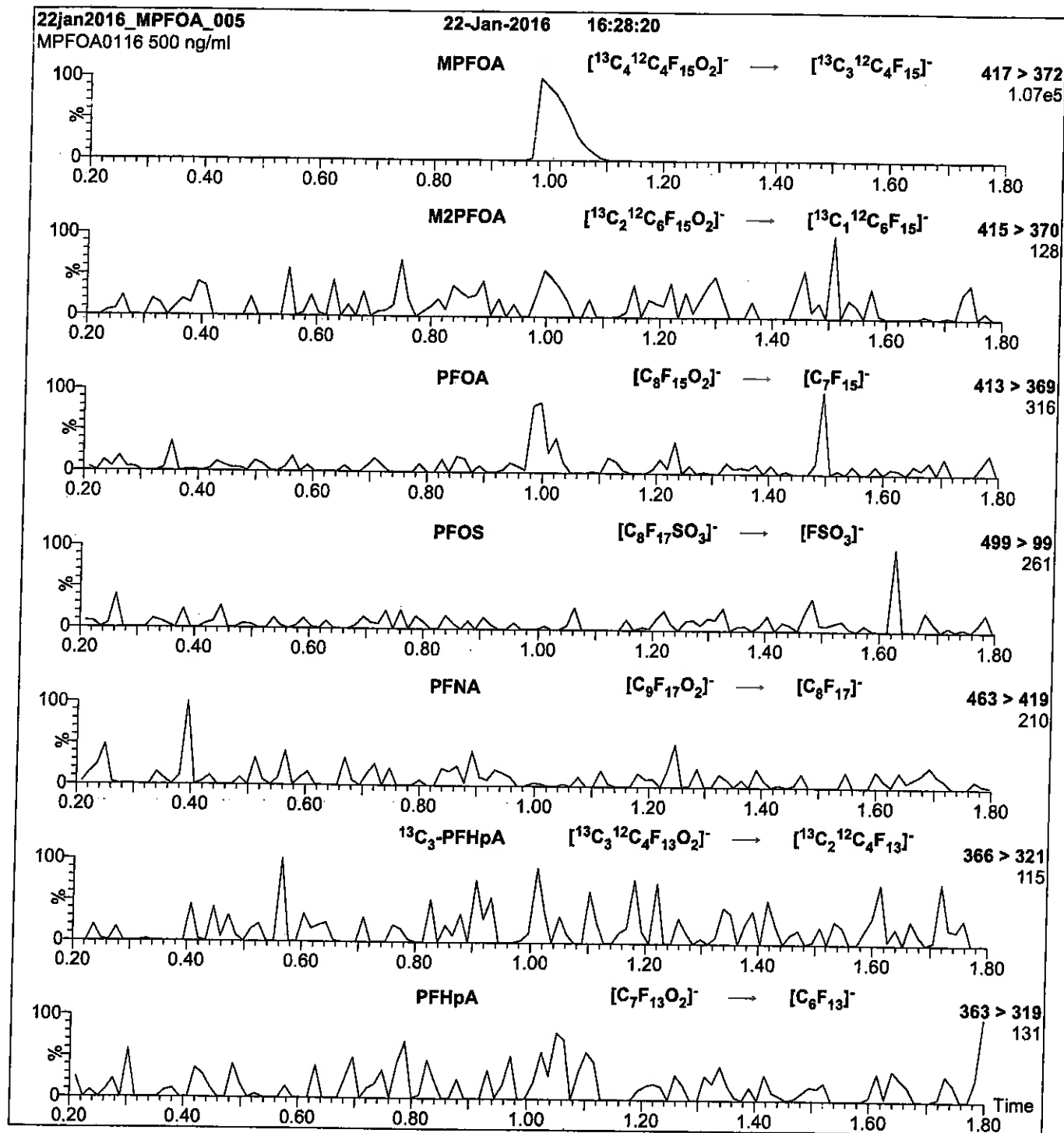
Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20%  $\text{H}_2\text{O}$   
(both with 10 mM  $\text{NH}_4\text{OAc}$  buffer)

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

**MS Parameters**

Collision Gas (mbar) =  $3.58\text{e-}3$   
Collision Energy (eV) = 10

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



**Conditions for Figure 2:**

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

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) = 3.58e-3  
Collision Energy (eV) = 10

Reagent

---

**LCMPFOS\_00017**

R: 9/9/16 802

728309  
ID: LCMFOS\_00017  
Exp: 08/03/21 Prod: SBC  
13C4-Perfluorooctanesulfonate

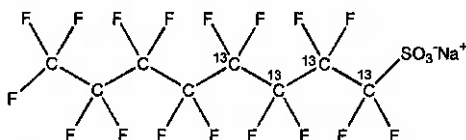


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** MPFOS **LOT NUMBER:** MPFOS0816  
**COMPOUND:** Sodium perfluoro-1-[1,2,3,4-<sup>13</sup>C<sub>4</sub>]octanesulfonate

**STRUCTURE:** **CAS #:** Not available



|                                  |                                                                                              |                          |                                                                  |
|----------------------------------|----------------------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------------|
| <b>MOLECULAR FORMULA:</b>        | <sup>13</sup> C <sub>4</sub> <sup>12</sup> C <sub>4</sub> F <sub>17</sub> SO <sub>3</sub> Na | <b>MOLECULAR WEIGHT:</b> | 526.08                                                           |
| <b>CONCENTRATION:</b>            | 50.0 ± 2.5 µg/ml (Na salt)<br>47.8 ± 2.4 µg/ml (MPFOS anion)                                 | <b>SOLVENT(S):</b>       | Methanol                                                         |
| <b>CHEMICAL PURITY:</b>          | >98%                                                                                         | <b>ISOTOPIC PURITY:</b>  | ≥99% <sup>13</sup> C<br>(1,2,3,4- <sup>13</sup> C <sub>4</sub> ) |
| <b>LAST TESTED:</b> (mm/dd/yyyy) | 08/03/2016                                                                                   |                          |                                                                  |
| <b>EXPIRY DATE:</b> (mm/dd/yyyy) | 08/03/2021                                                                                   |                          |                                                                  |
| <b>RECOMMENDED STORAGE:</b>      | 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

**Date:** 08/05/2016  
(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.

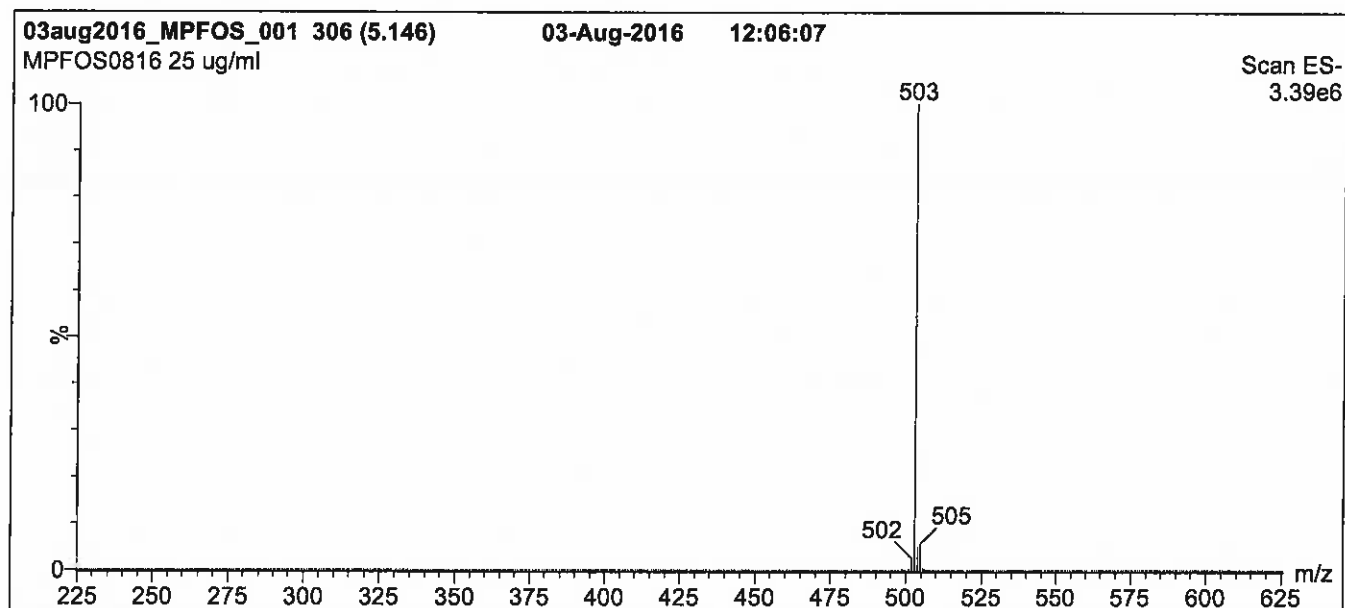
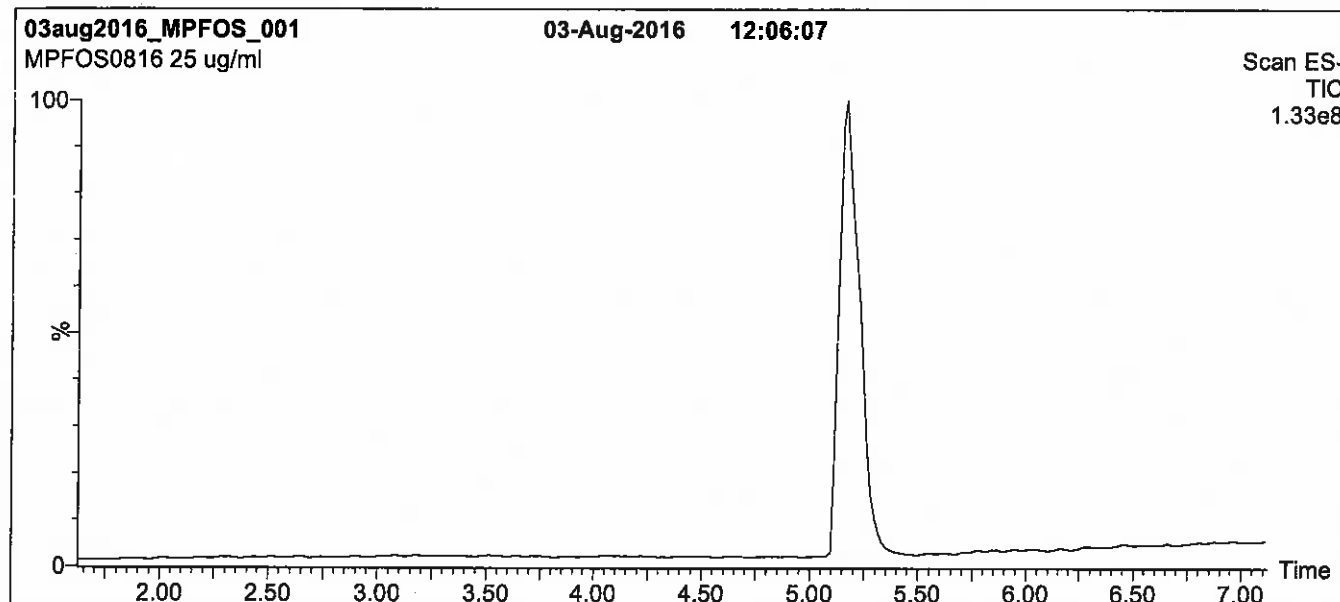
**QUALITY MANAGEMENT:**

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: 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: 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 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

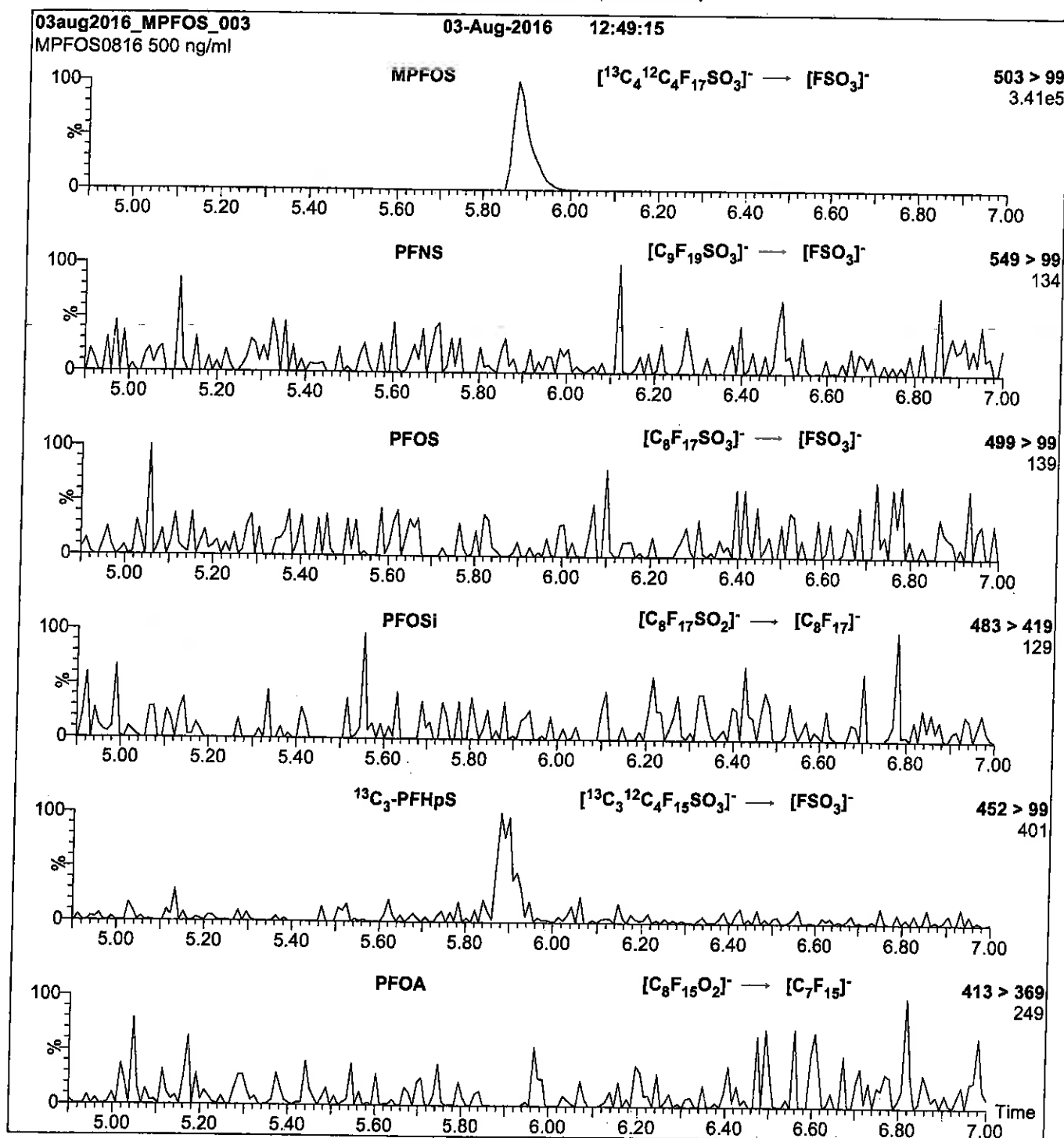
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 60.00  
Cone Gas Flow (l/hr) = 50  
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) = 3.46e-3  
Collision Energy (eV) = 40

Reagent

---

**LCMPFOS\_00018**

R: SBC 9/22/16

738686  
ID: LCMFOS\_00018  
Exp: 08/03/21 Prod: SBC  
13C4-Perfluorooctanesulfo



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

MPFOS

**LOT NUMBER:**

MPFOS0816

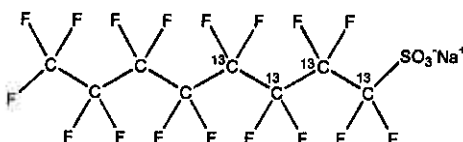
**COMPOUND:**

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

**CONCENTRATION:**

50.0 ± 2.5 µg/ml (Na salt)

47.8 ± 2.4 µg/ml (MPFOS anion)

**CHEMICAL PURITY:**

>98%

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

08/03/2016

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

08/03/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:**

526.08

**SOLVENT(S):**

Methanol

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C  
(1,2,3,4-<sup>13</sup>C<sub>4</sub>)

**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

Date: 08/05/2016

(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:**

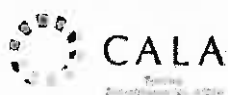
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

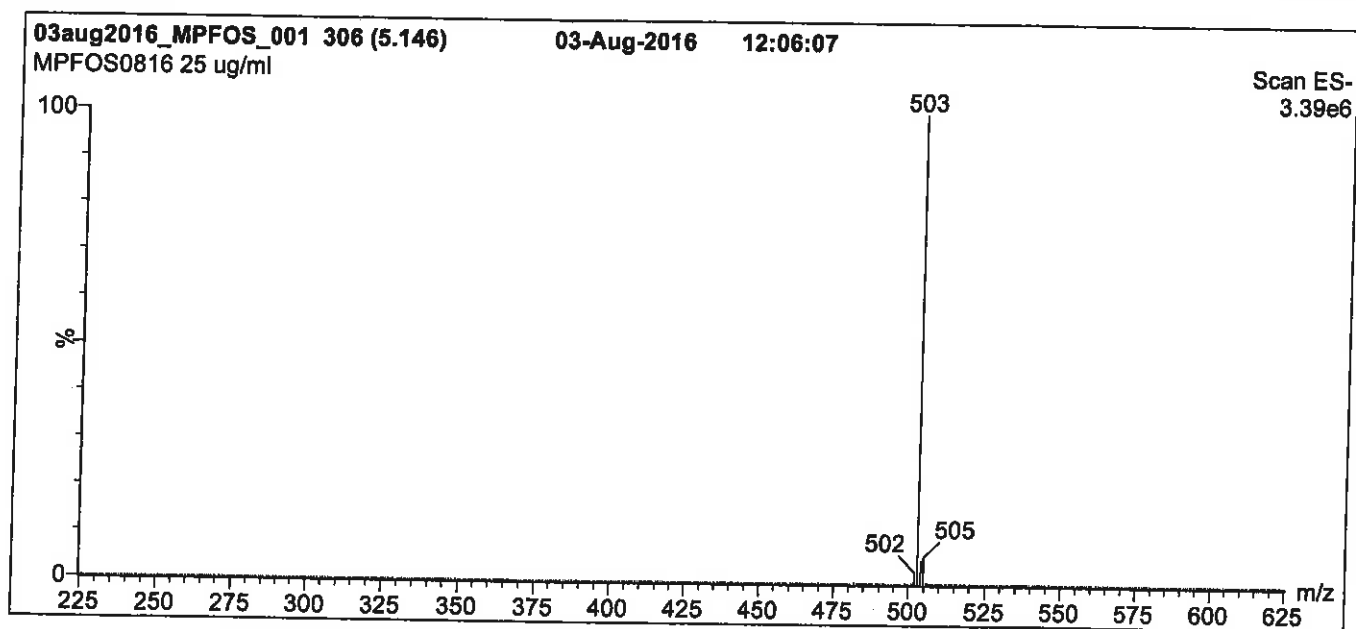
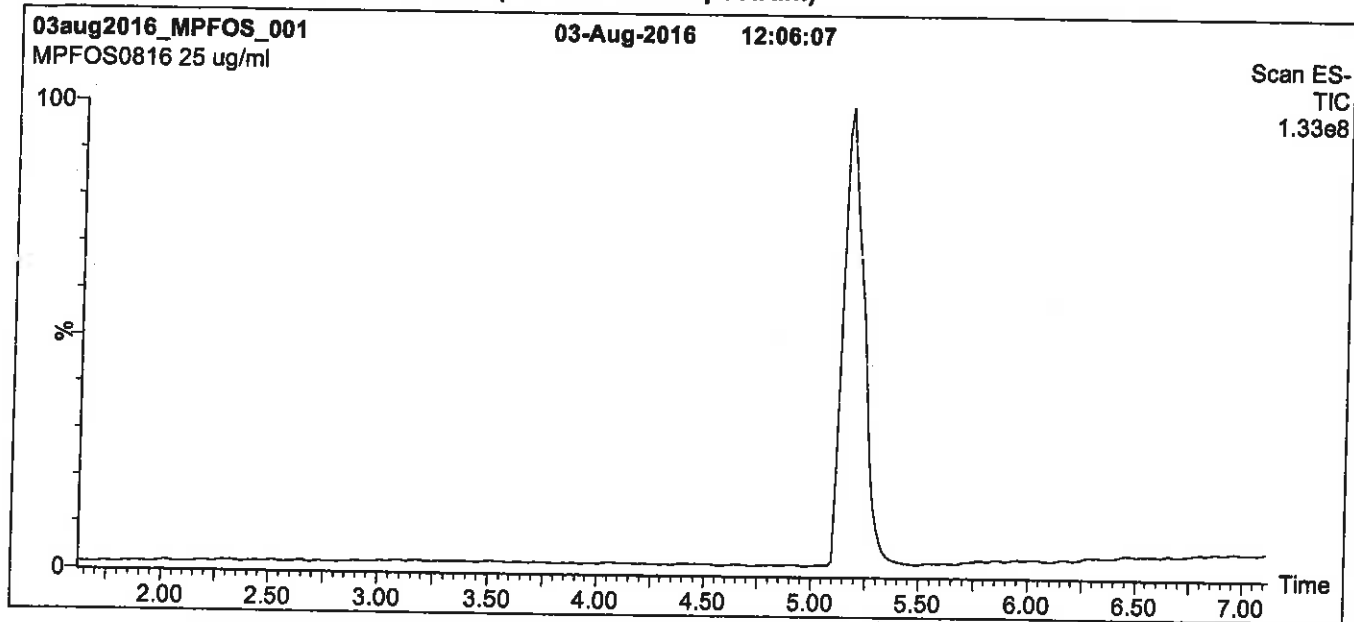
**QUALITY MANAGEMENT:**

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: 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: 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 7 min and hold for 1.5 min  
before returning to initial conditions in 0.5 min.

Time: 10 min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)

Capillary Voltage (kV) = 3.00

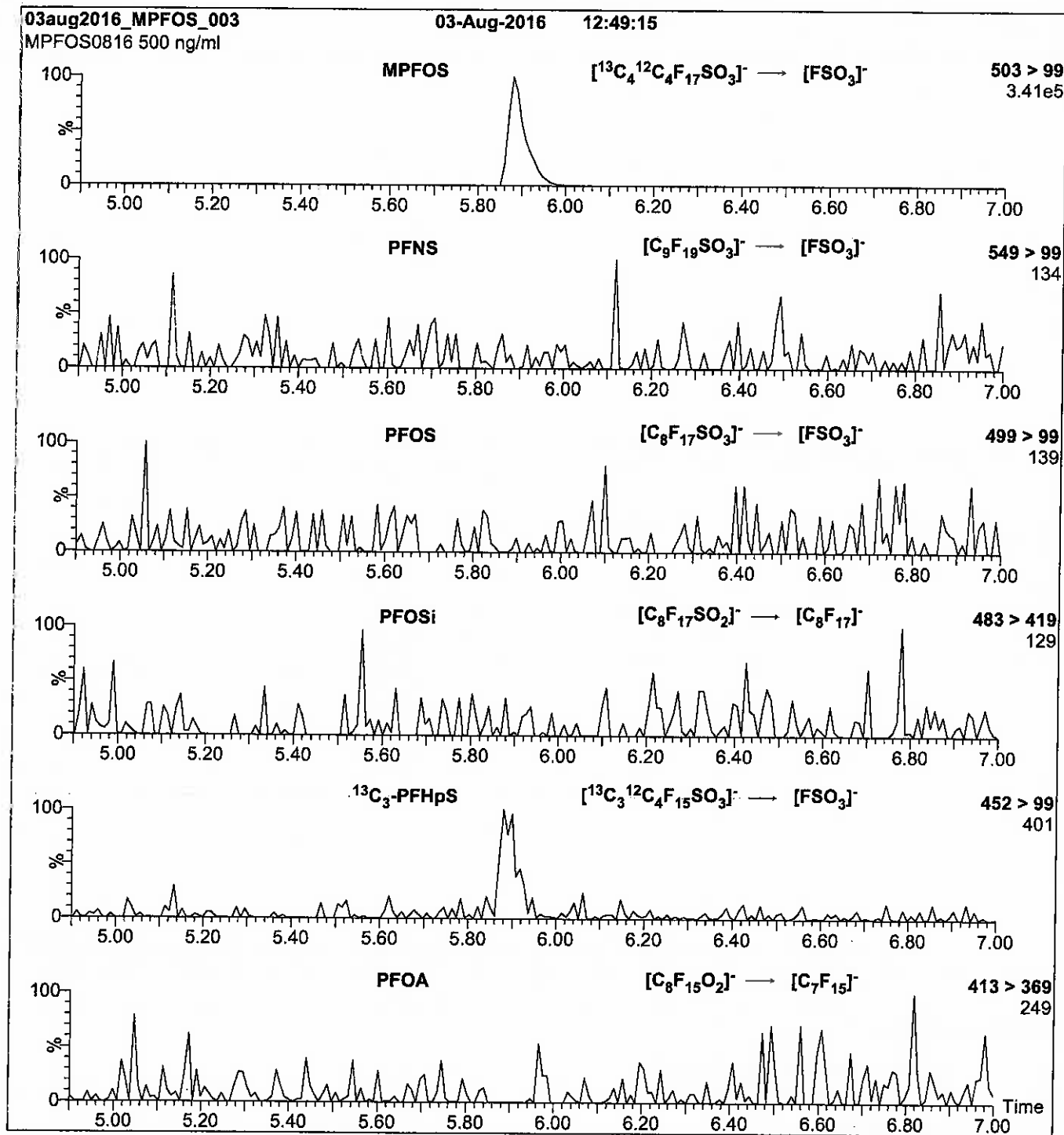
Cone Voltage (V) = 60.00

Cone Gas Flow (l/hr) = 50

Desolvation Gas Flow (l/hr) = 750

Flow: 300  $\mu$ l/min

**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) = 3.46e-3  
Collision Energy (eV) = 40



Reagent

---

**LCMPFUdA\_00009**

R: SBC 9/22/16



739604

ID: LCMFUDa\_00009

Exp: 02/12/21 Prod: SBC

<sup>13</sup>C2-Perfluoroundecanoic



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

Scanned 10/14/16 SK

**PRODUCT CODE:**

MPFUDa

**LOT NUMBER:**

MPFUDa0216

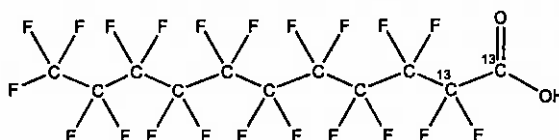
**COMPOUND:**

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

**STRUCTURE:**

**CAS #:**

Not available



**MOLECULAR FORMULA:**

<sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>9</sub>HF<sub>21</sub>O<sub>2</sub>

**CONCENTRATION:**

50 ± 2.5 µg/ml

**MOLECULAR WEIGHT:**

566.08

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

**ISOTOPIC PURITY:**

≥99% <sup>13</sup>C

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

02/12/2016

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

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

02/12/2021

**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.
- Presence of 1-<sup>13</sup>C<sub>1</sub>-PFUDa (~1%; see Figure 2), 2-<sup>13</sup>C<sub>1</sub>-PFUDa (~1%), and PFUDa (~0.2%; see Figure 2) are due to the isotopic purity of the <sup>13</sup>C-precursor.

**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:**

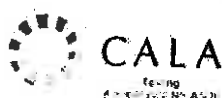
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

### **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.

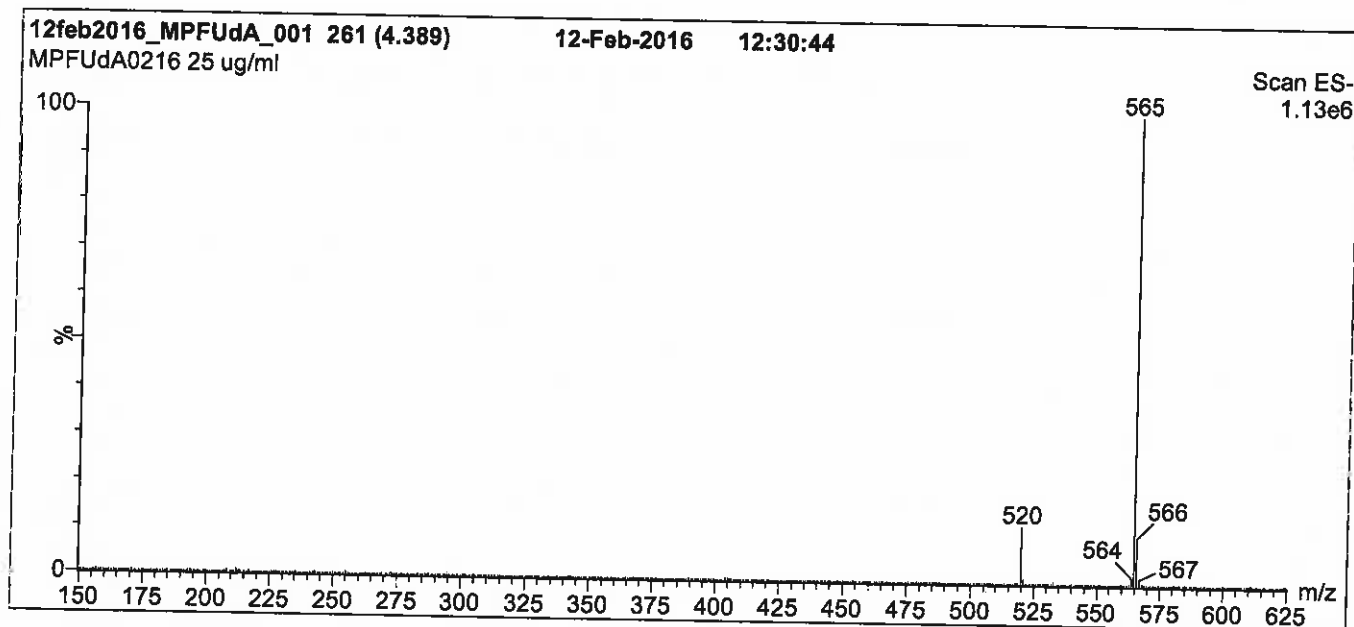
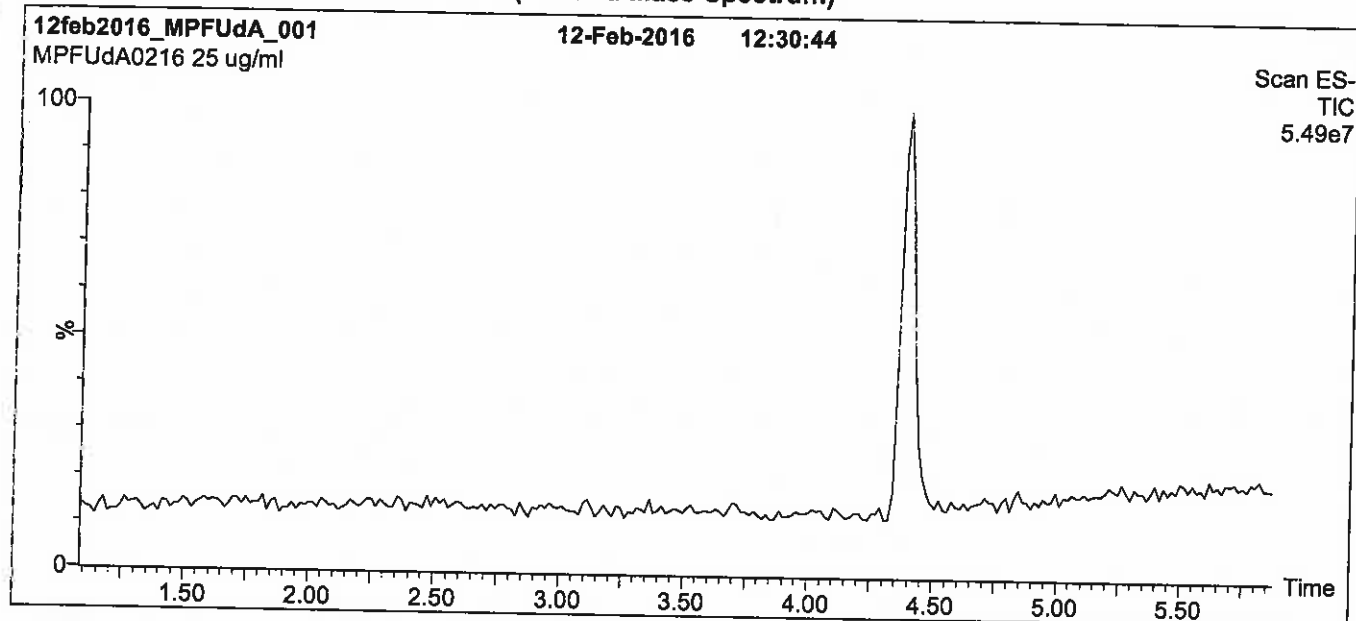
### **QUALITY MANAGEMENT:**

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: MPFUdA; 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: 60% (80:20 MeOH:ACN) / 40% 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

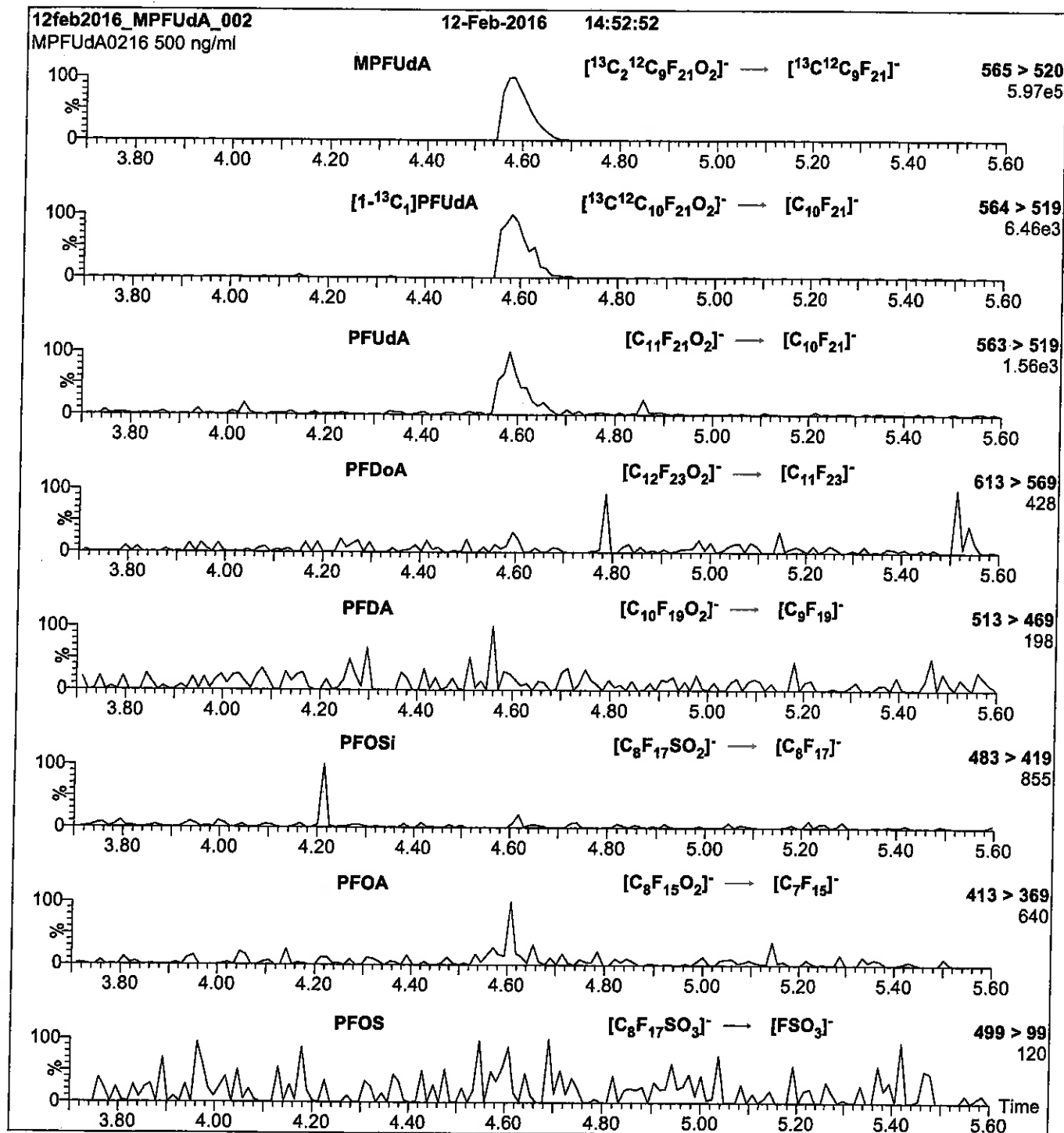
**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 3.00  
**Cone Voltage (V)** = 15.00  
**Cone Gas Flow (l/hr)** = 65  
**Desolvation Gas Flow (l/hr)** = 750

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



**Conditions for Figure 2:**

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

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

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

**MS Parameters**

Collision Gas (mbar) = 3.35e-3  
Collision Energy (eV) = 11

Reagent

---

**LCN-EtFOSA-M\_00003**

R: 8/23/16 SBC



715563  
ID: LCN-EtFOSA-M\_00003  
Exp: 05/24/21 Prod: SBC  
N-EtFOSA-M



# WELLINGTON LABORATORIES

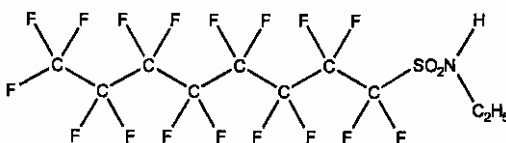
## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** N-EtFOSA-M  
**COMPOUND:** N-ethylperfluoro-1-octanesulfonamide

**LOT NUMBER:** NEtFOSA0516M

**STRUCTURE:**

**CAS #:** 4151-50-2



**MOLECULAR FORMULA:**  $C_{10}H_8F_{17}NO_2S$   
**CONCENTRATION:**  $50 \pm 2.5 \mu\text{g/ml}$   
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 05/24/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 05/24/2021  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:** 527.20  
**SOLVENT(S):** Methanol

**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.

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

**Certified By:**

B.G. Chittim

**Date:** 05/27/2016  
(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:**

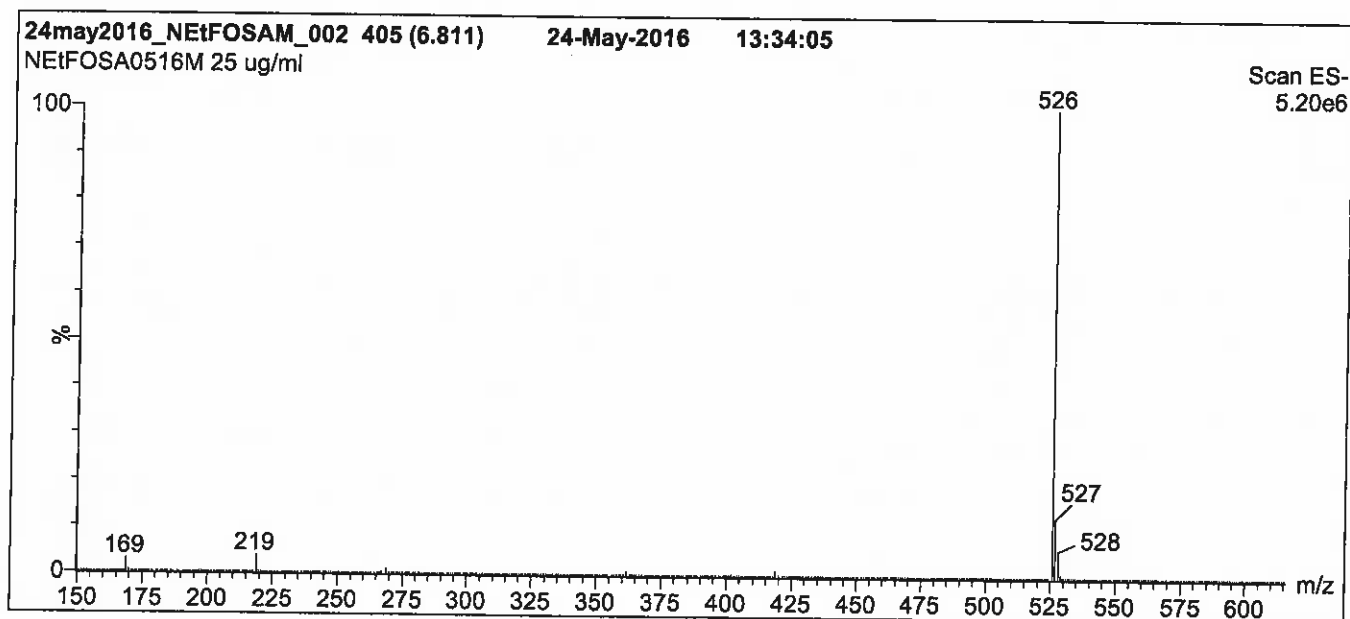
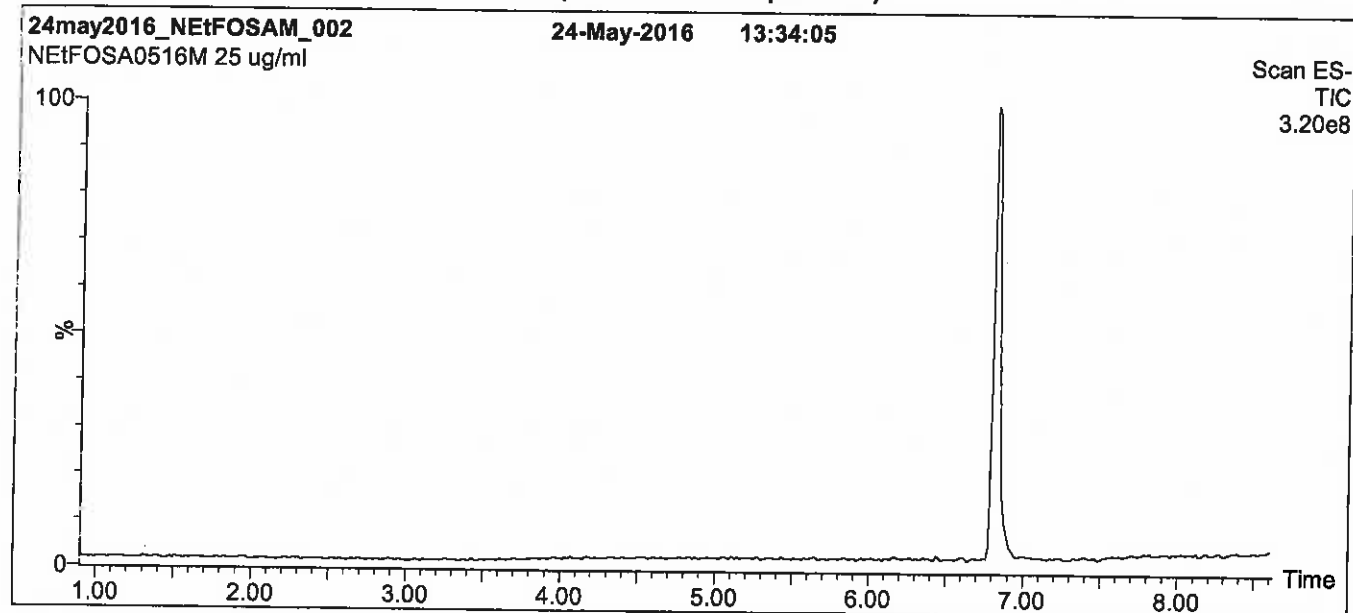
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*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: N-EtFOSA-M; 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% H<sub>2</sub>O / 55% (80:20 MeOH:ACN)  
(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

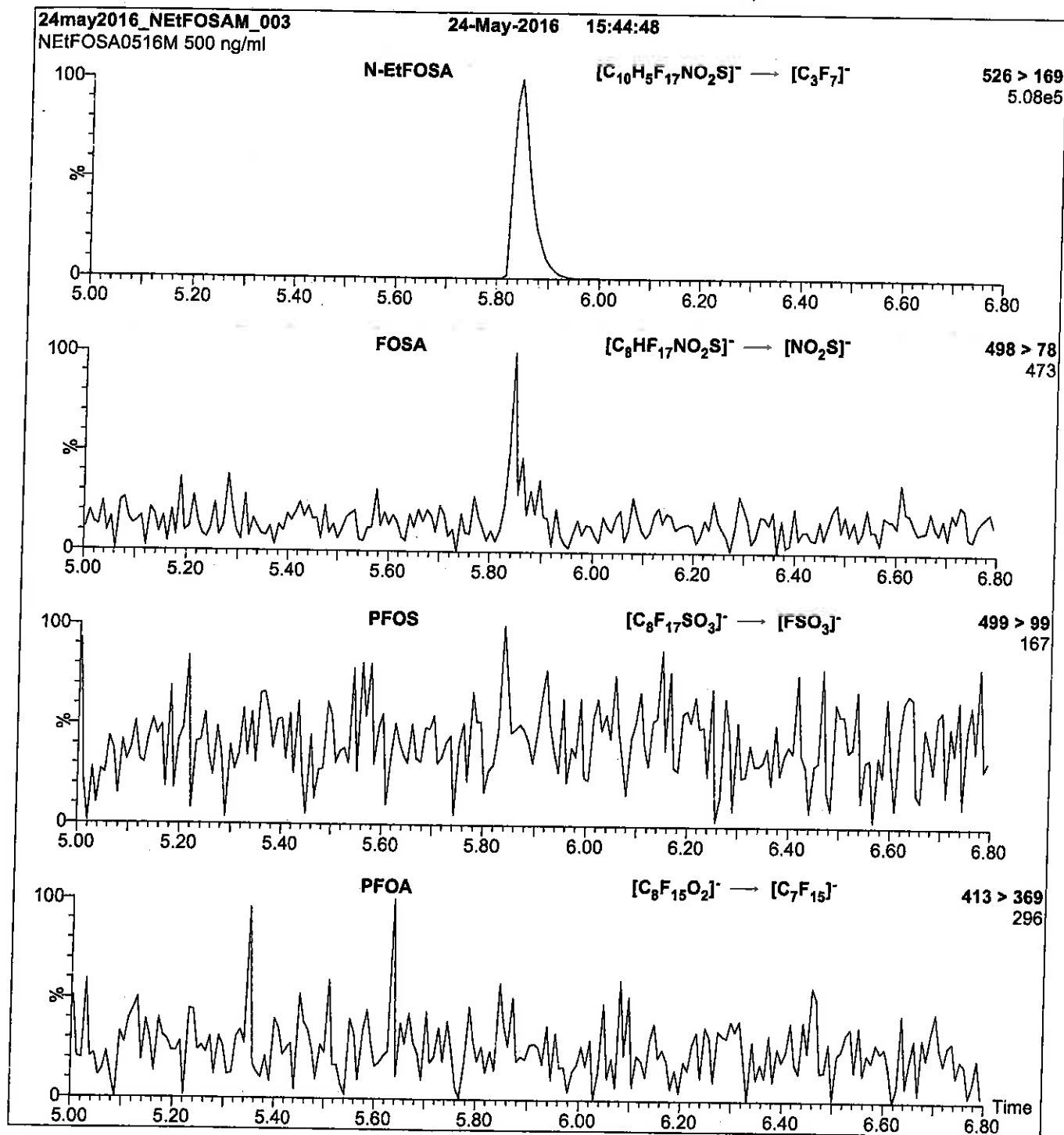
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.50  
Cone Voltage (V) = 40.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10 µl (500 ng/ml N-EtFOSA-M)

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 µl/min

**MS Parameters**

Collision Gas (mbar) = 3.54e-3  
Collision Energy (eV) = 30

Reagent

---

**LCN-EtFOSAA\_00002**

R: 8/23/16 SBC



715561

ID: LCN-EtFOSAA\_00002

Exp: 01/20/21 Prod: SBC

N-EtFOSAA



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

N-EtFOSAA

**LOT NUMBER:**

NEtFOSAA0116

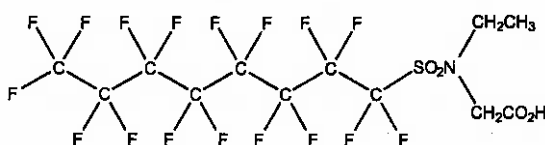
**COMPOUND:**

N-ethylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:**

**CAS #:**

2991-50-6



**MOLECULAR FORMULA:**

C<sub>12</sub>H<sub>8</sub>F<sub>17</sub>NO<sub>4</sub>S

**MOLECULAR WEIGHT:**

585.23

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

01/20/2016

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

01/20/2021

**RECOMMENDED STORAGE:**

Refrigerate ampoule

**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 the conversion of the acetic acid moiety to the methyl ester.

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

Certified By:

B.G. Chittim

Date: 01/21/2016

(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.

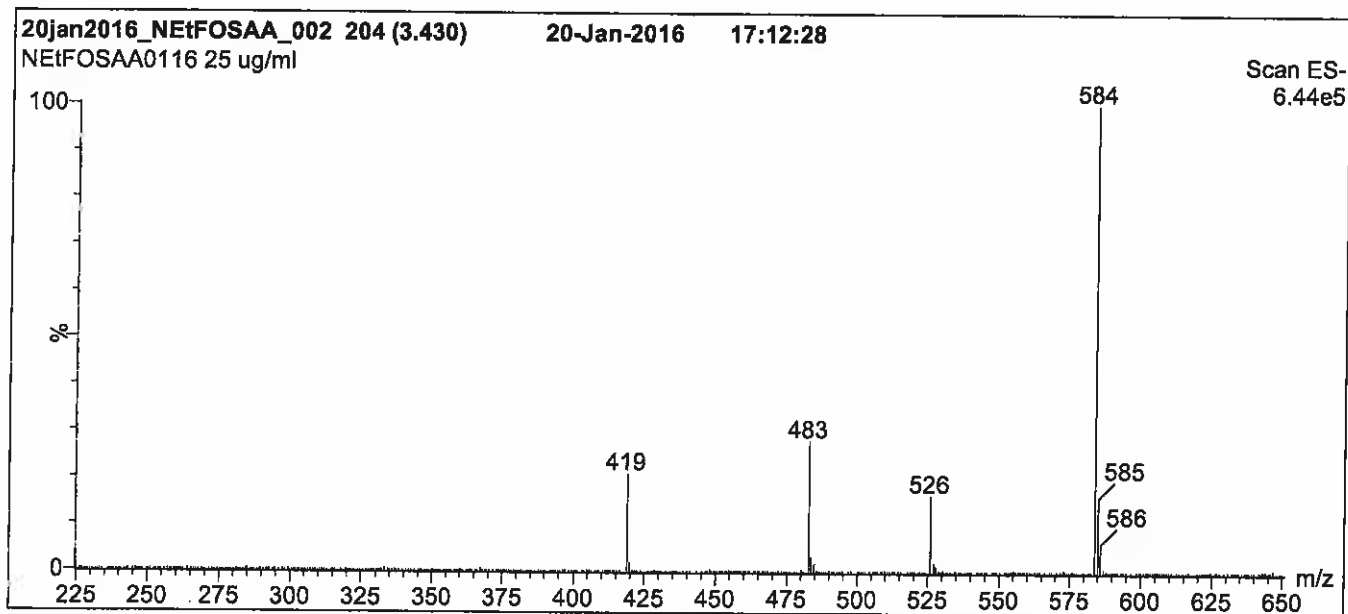
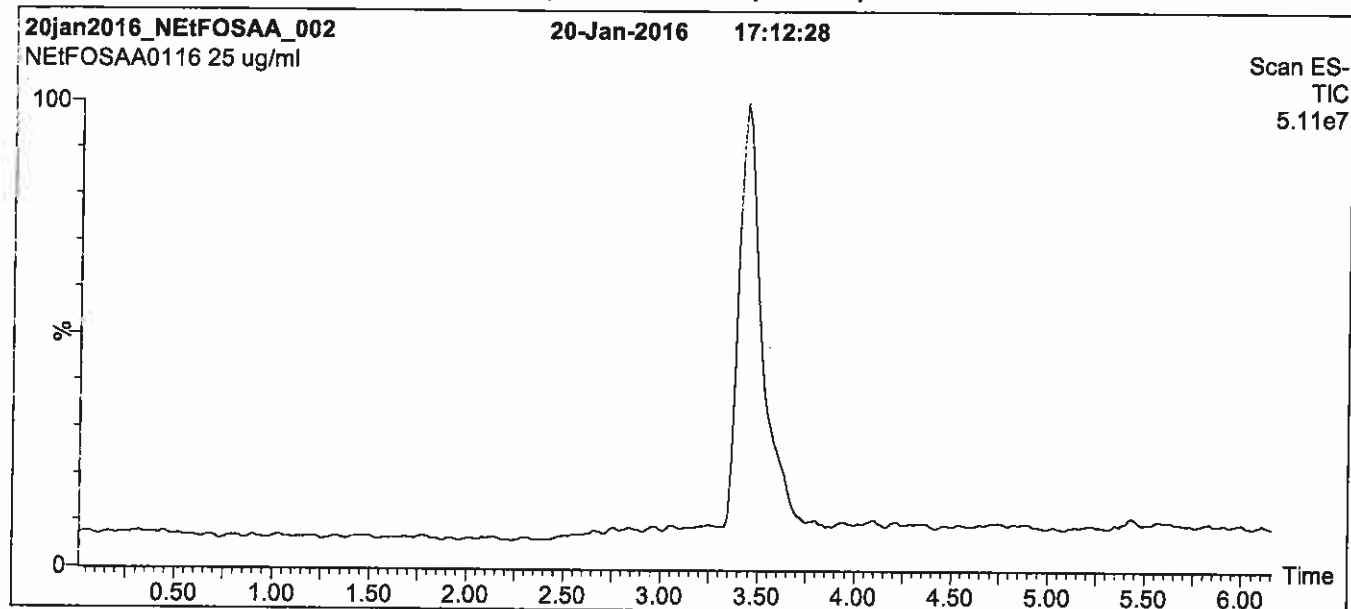
**QUALITY MANAGEMENT:**

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: N-EtFOSAA; 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: 60% (80:20 MeOH:ACN) / 40% 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

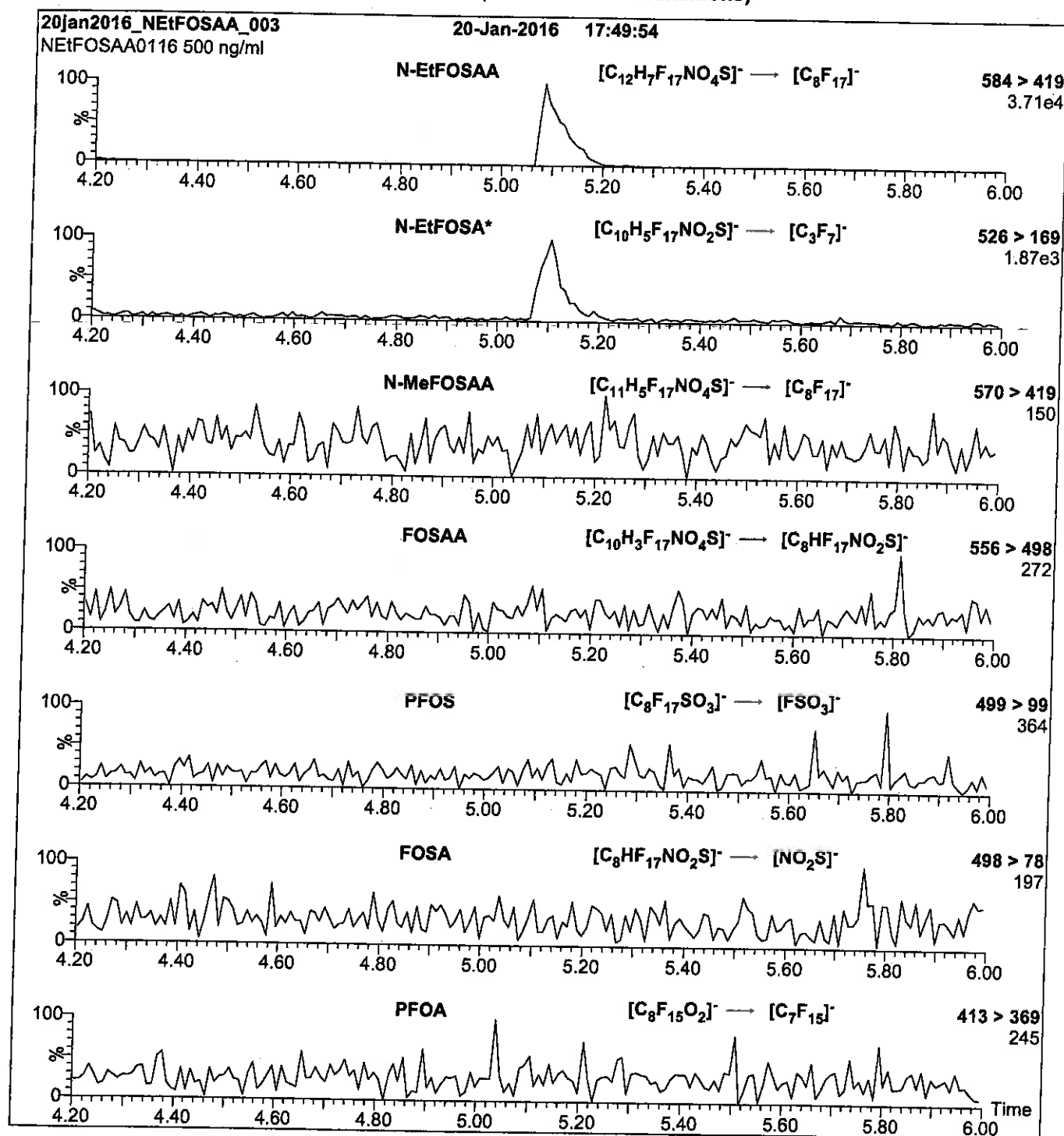
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 35.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



**Note:** N-EtFOSA is formed by fragmentation of N-EtFOSAA.

**Conditions for Figure 2:**

**Injection:** Direct loop injection  
10  $\mu$ l (500 ng/ml N-EtFOSAA)

**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) = 3.66e-3  
Collision Energy (eV) = 25

Reagent

---

**LCN-MeFOSA-M\_00002**



R: 8/23/16 SBC



715564

ID: LCN-MeFOSA-M\_00002

Exp: 05/24/21 Prpt: SBC

N-MeFOSA-M



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

N-MeFOSA-M

**LOT NUMBER:**

NMeFOSA0516M

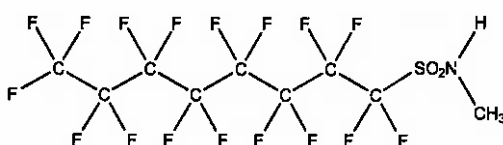
**COMPOUND:**

N-methylperfluoro-1-octanesulfonamide

**STRUCTURE:**

**CAS #:**

31506-32-8



**MOLECULAR FORMULA:**

C<sub>8</sub>H<sub>4</sub>F<sub>17</sub>NO<sub>2</sub>S

**CONCENTRATION:**

50 ± 2.5 µg/ml

**CHEMICAL PURITY:**

>98%

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

05/24/2016

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

05/24/2021

**RECOMMENDED STORAGE:**

Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:**

513.17

**SOLVENT(S):**

Methanol

**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.

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

**Certified By:**

B.G. Chittim

**Date:** 05/26/2016

(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.

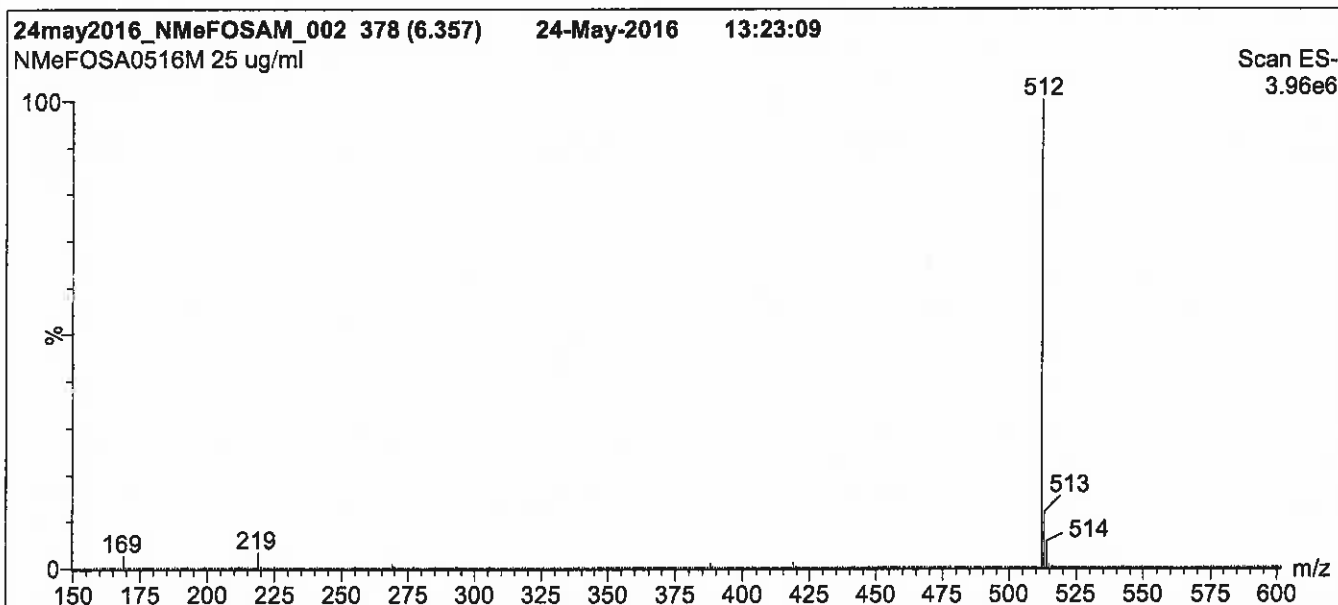
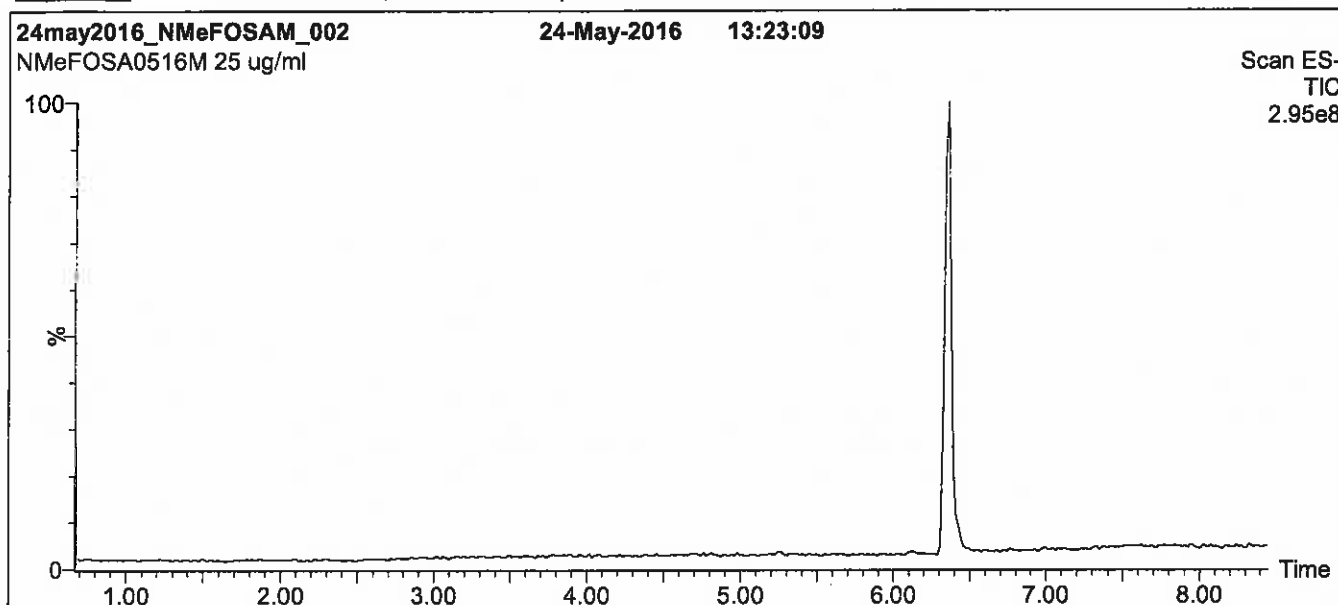
**QUALITY MANAGEMENT:**

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: N-MeFOSA-M; 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% H<sub>2</sub>O / 55% (80:20 MeOH:ACN)  
(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

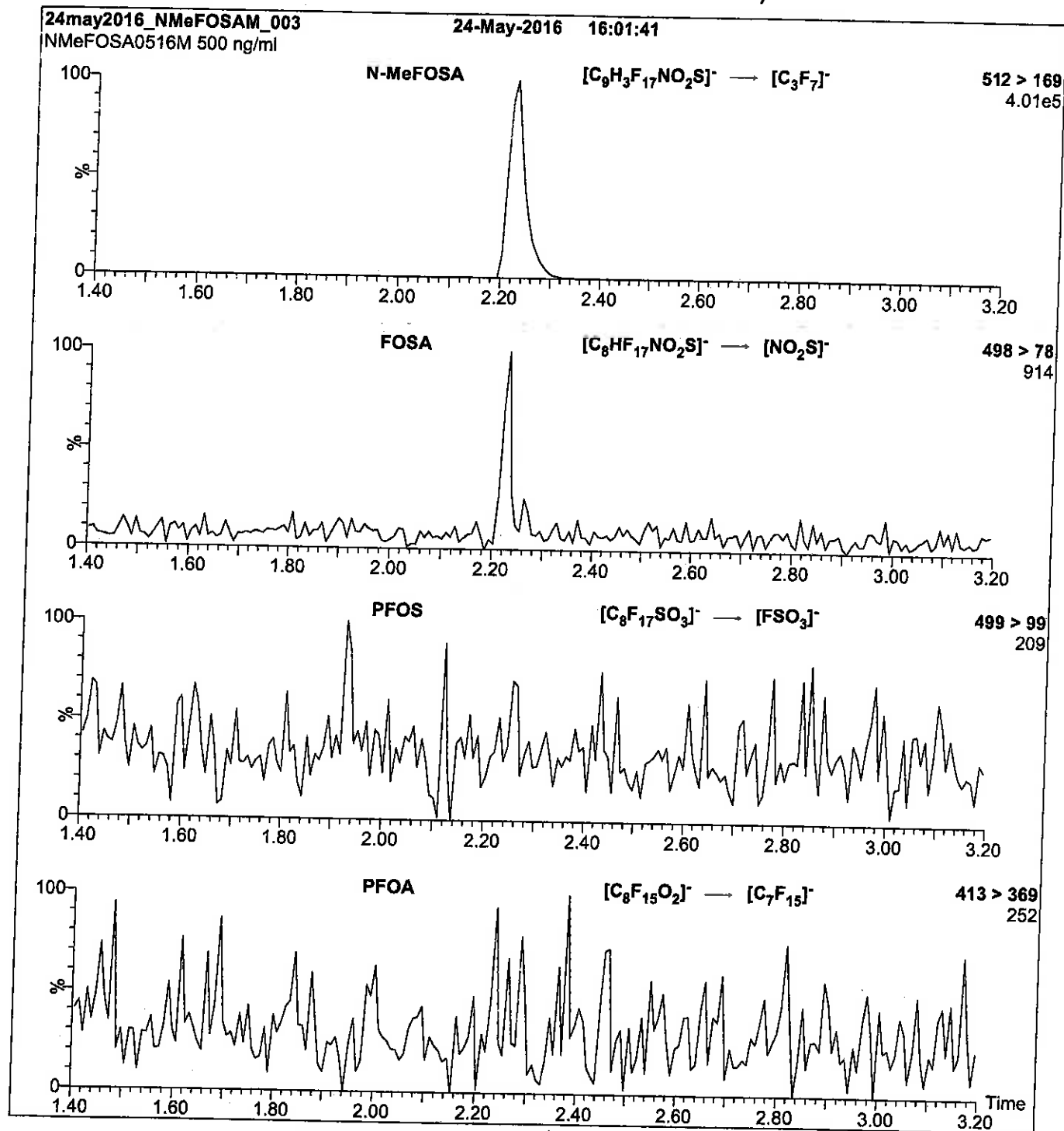
**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 2.50  
**Cone Voltage (V)** = 40.00  
**Cone Gas Flow (l/hr)** = 50  
**Desolvation Gas Flow (l/hr)** = 750

**Figure 2: N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml N-MeFOSA-M)

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) = 3.54e-3  
Collision Energy (eV) = 30

Reagent

---

**LCN-MeFOSAA\_00003**

R: 8/23/16 SAE

715562  
ID: LCN-MeFOSAA\_00003  
Exp: 01/20/21 Prod: SEC  
N-MeFOSAA

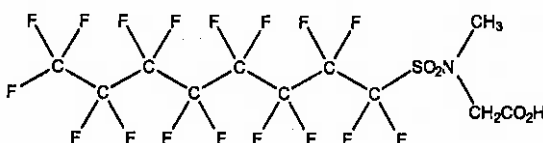


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** N-MeFOSAA **LOT NUMBER:** NMeFOSAA0116  
**COMPOUND:** N-methylperfluoro-1-octanesulfonamidoacetic acid

**STRUCTURE:** **CAS #:** 2355-31-9



**MOLECULAR FORMULA:**  $C_{11}H_8F_{17}NO_4S$  **MOLECULAR WEIGHT:** 571.21  
**CONCENTRATION:**  $50 \pm 2.5 \mu\text{g/ml}$  **SOLVENT(S):** Methanol  
Water (<1%)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 01/20/2016  
**EXPIRY DATE:** (mm/dd/yyyy) 01/20/2021  
**RECOMMENDED STORAGE:** Refrigerate ampoule

### 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 the conversion of the acetic acid moiety to the methyl ester.

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

Certified By:

B.G. Chittim

Date: 01/21/2016  
(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.

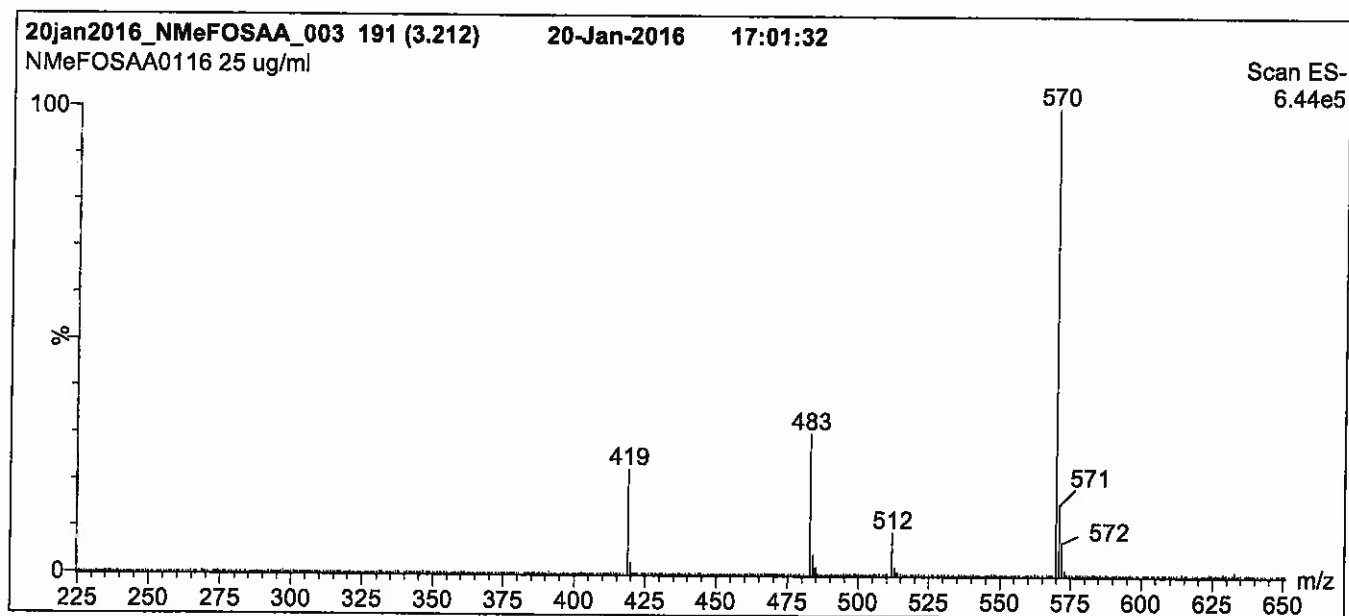
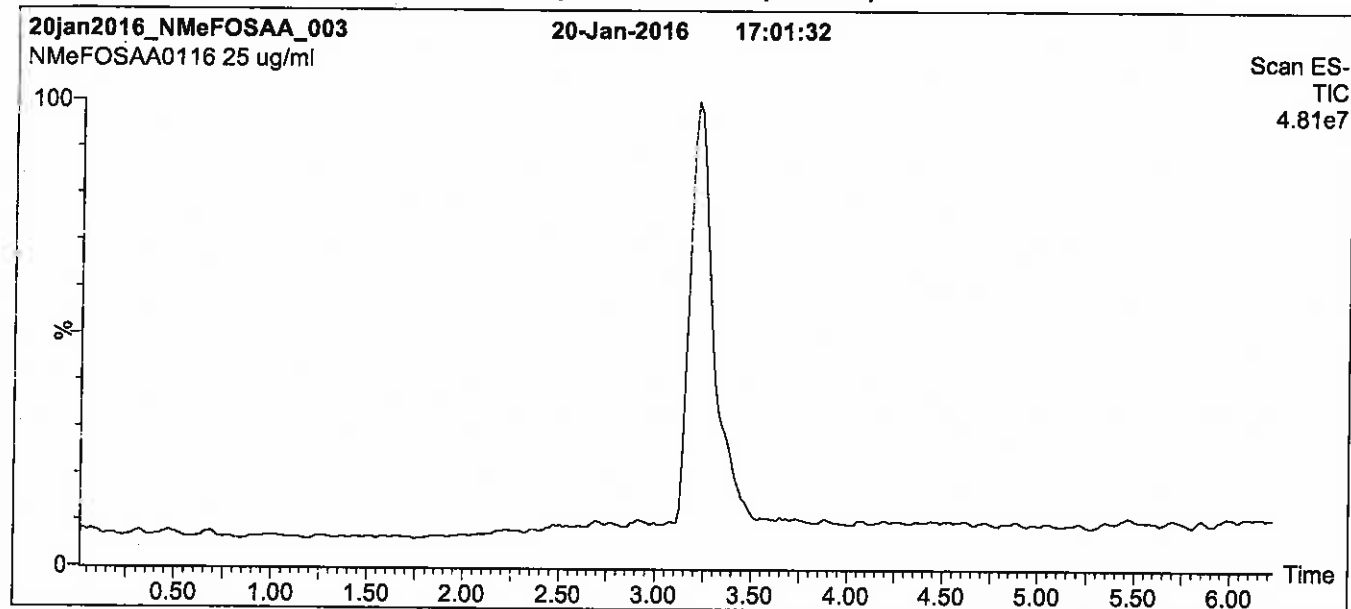
**QUALITY MANAGEMENT:**

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: N-MeFOSAA; 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: 60% (80:20 MeOH:ACN) / 40% 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

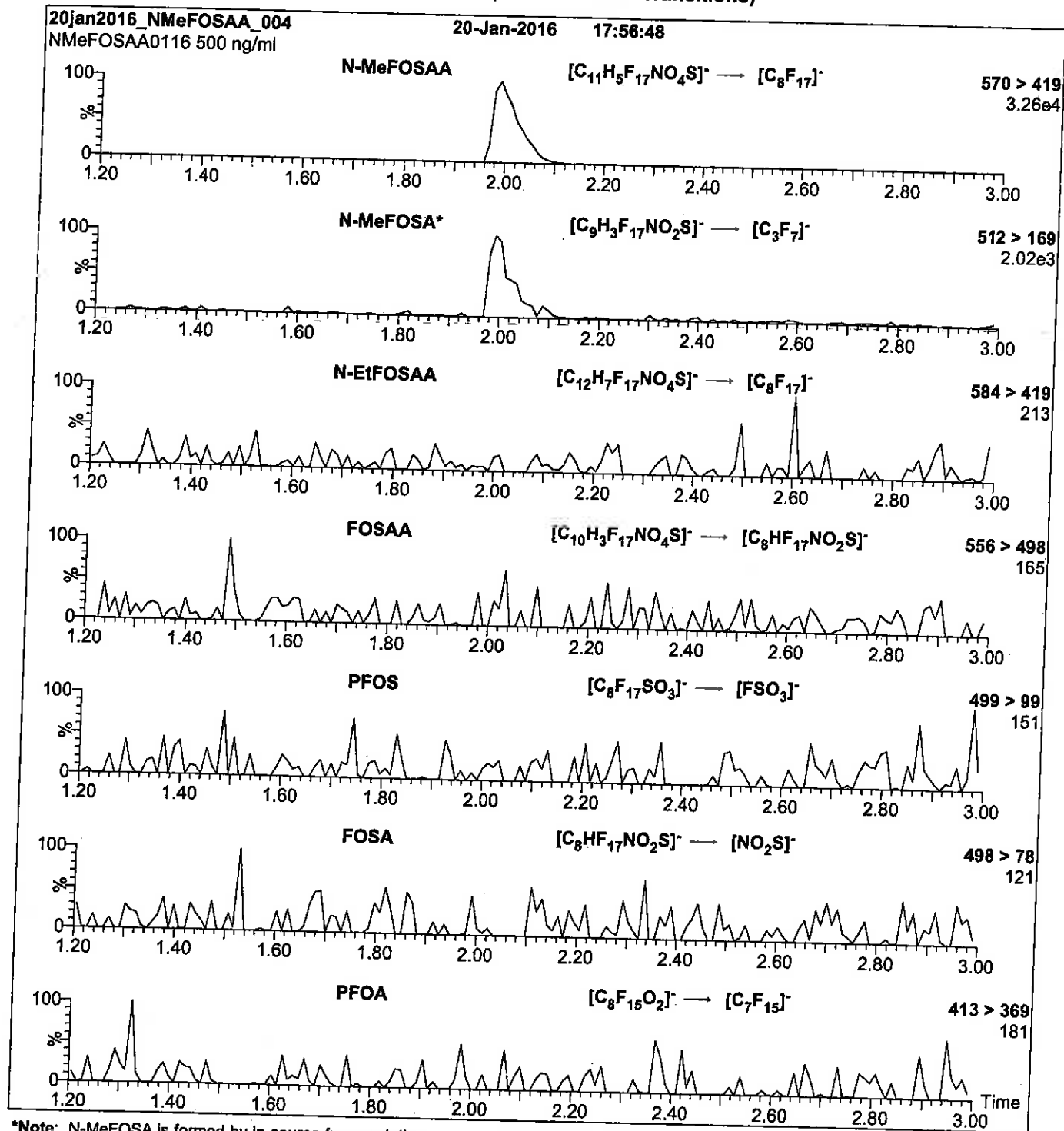
**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 35.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750



**Figure 2: N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



\*Note: N-MeFOSA is formed by in-source fragmentation.

**Conditions for Figure 2:**

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

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) = 3.66e-3  
Collision Energy (eV) = 25

Reagent

---

**LCPFACMXB\_00007**



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

### PFAC-MXB

**Solution/Mixture of Native  
Perfluoroalkylcarboxylic Acids and  
Native Perfluoroalkylsulfonates**

**PRODUCT CODE:** PFAC-MXB  
**LOT NUMBER:** PFACMXB1115  
**SOLVENT(S):** Methanol / Water (<1%)  
**DATE PREPARED:** (mm/dd/yyyy) 11/04/2015  
**LAST TESTED:** (mm/dd/yyyy) 11/06/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 11/06/2020  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

### DESCRIPTION:

PFAC-MXB is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C<sub>4</sub>-C<sub>14</sub>, C<sub>16</sub>, and C<sub>18</sub>) and four native perfluoroalkylsulfonates (C<sub>4</sub>, C<sub>6</sub>, C<sub>8</sub> and C<sub>10</sub>). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

### DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture  
 Figure 1: LC/MS Data (SiR)  
 Figure 2: LC/MS/MS Data (Selected MRM Transitions)  
 Figure 3: 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 acids to their respective methyl esters.

**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:**

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)\*\*

**Table A: PFAC-MXB; Components and Concentrations (ng/ml,  $\pm$  5% in Methanol / Water (<1%))**

| Name                                  | Abbreviation | Concentration (ng/ml) |              | Peak Assignment In Figure 1 |
|---------------------------------------|--------------|-----------------------|--------------|-----------------------------|
| Perfluoro-n-butanoic acid             | PFBA         | 2000                  |              | A                           |
| Perfluoro-n-pentanoic acid            | PFPeA        | 2000                  |              | B                           |
| Perfluoro-n-hexanoic acid             | PFHxA        | 2000                  |              | D                           |
| Perfluoro-n-heptanoic acid            | PFHpA        | 2000                  |              | E                           |
| Perfluoro-n-octanoic acid             | PFOA         | 2000                  |              | G                           |
| Perfluoro-n-nonanoic acid             | PFNA         | 2000                  |              | H                           |
| Perfluoro-n-decanoic acid             | PFDA         | 2000                  |              | J                           |
| Perfluoro-n-undecanoic acid           | PFUdA        | 2000                  |              | K                           |
| Perfluoro-n-dodecanoic acid           | PFDoA        | 2000                  |              | M                           |
| Perfluoro-n-tridecanoic acid          | PFTrDA       | 2000                  |              | N                           |
| Perfluoro-n-tetradecanoic acid        | PFTeDA       | 2000                  |              | O                           |
| Perfluoro-n-hexadecanoic acid         | PFHxDA       | 2000                  |              | P                           |
| Perfluoro-n-octadecanoic acid         | PFODA        | 2000                  |              | Q                           |
| Name                                  | Abbreviation | Concentration (ng/ml) |              | Peak Assignment In Figure 1 |
|                                       |              | as the salt           | as the anion |                             |
| Potassium perfluoro-1-butanesulfonate | L-PFBS       | 2000                  | 1770         | C                           |
| Sodium perfluoro-1-hexanesulfonate    | L-PFHxS      | 2000                  | 1890         | F                           |
| Sodium perfluoro-1-octanesulfonate    | L-PFOS       | 2000                  | 1910         | I                           |
| Sodium perfluoro-1-decanesulfonate    | L-PFDS       | 2000                  | 1930         | L                           |

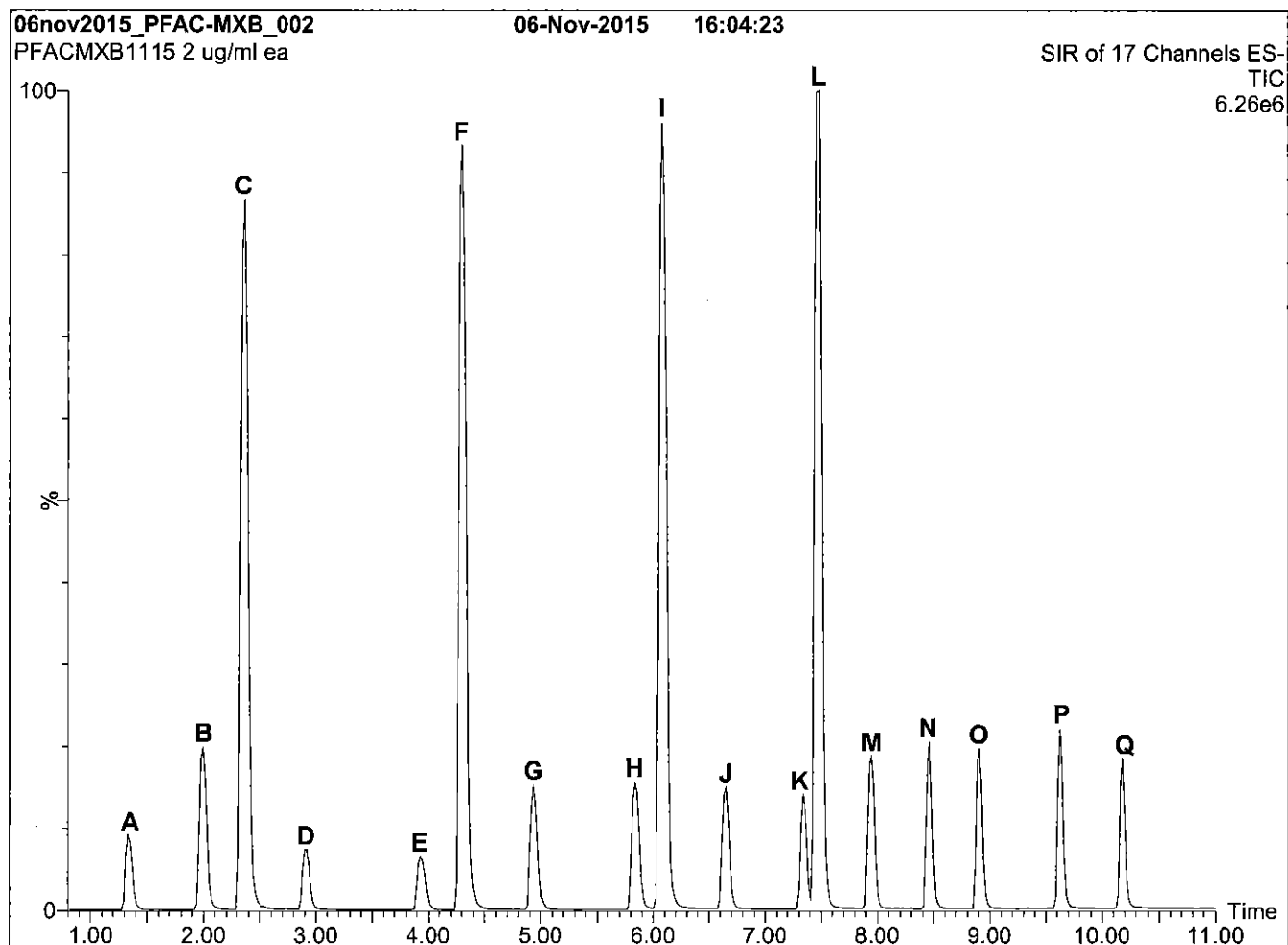
Certified By:

  
B.G. Chittim

Date: 11/11/2015

(mm/dd/yyyy)

**Figure 1:** PFAC-MXB; LC/MS Data (Total Ion Current Chromatogram; SIR)



**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: 55% H<sub>2</sub>O / 45% (80:20 MeOH:ACN)  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 95% organic over 10 min and hold for 1 min  
before returning to initial conditions in 0.5 min.

Time: 12 min

Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: SIR of 17 Channels

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = variable (10-70)  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**

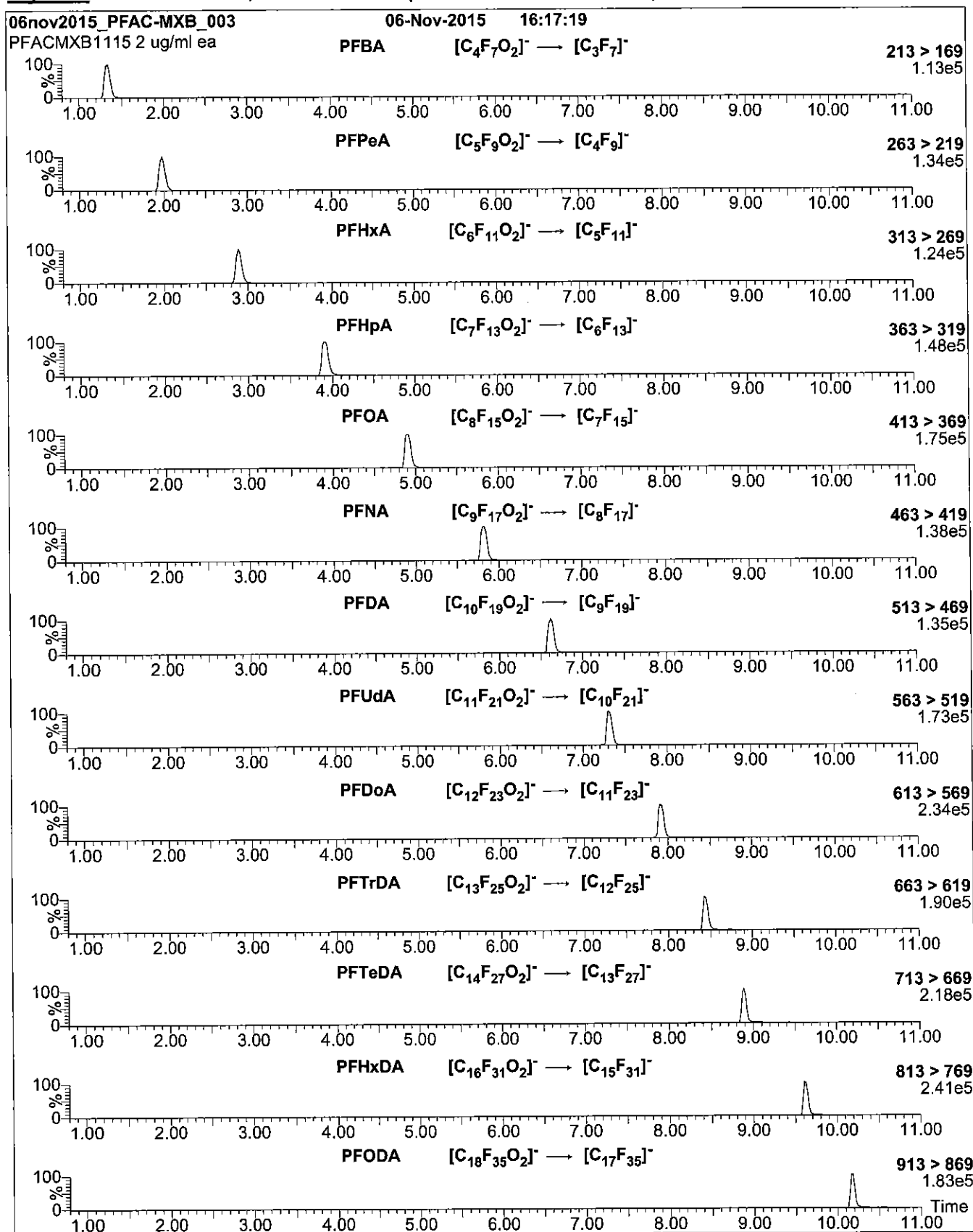
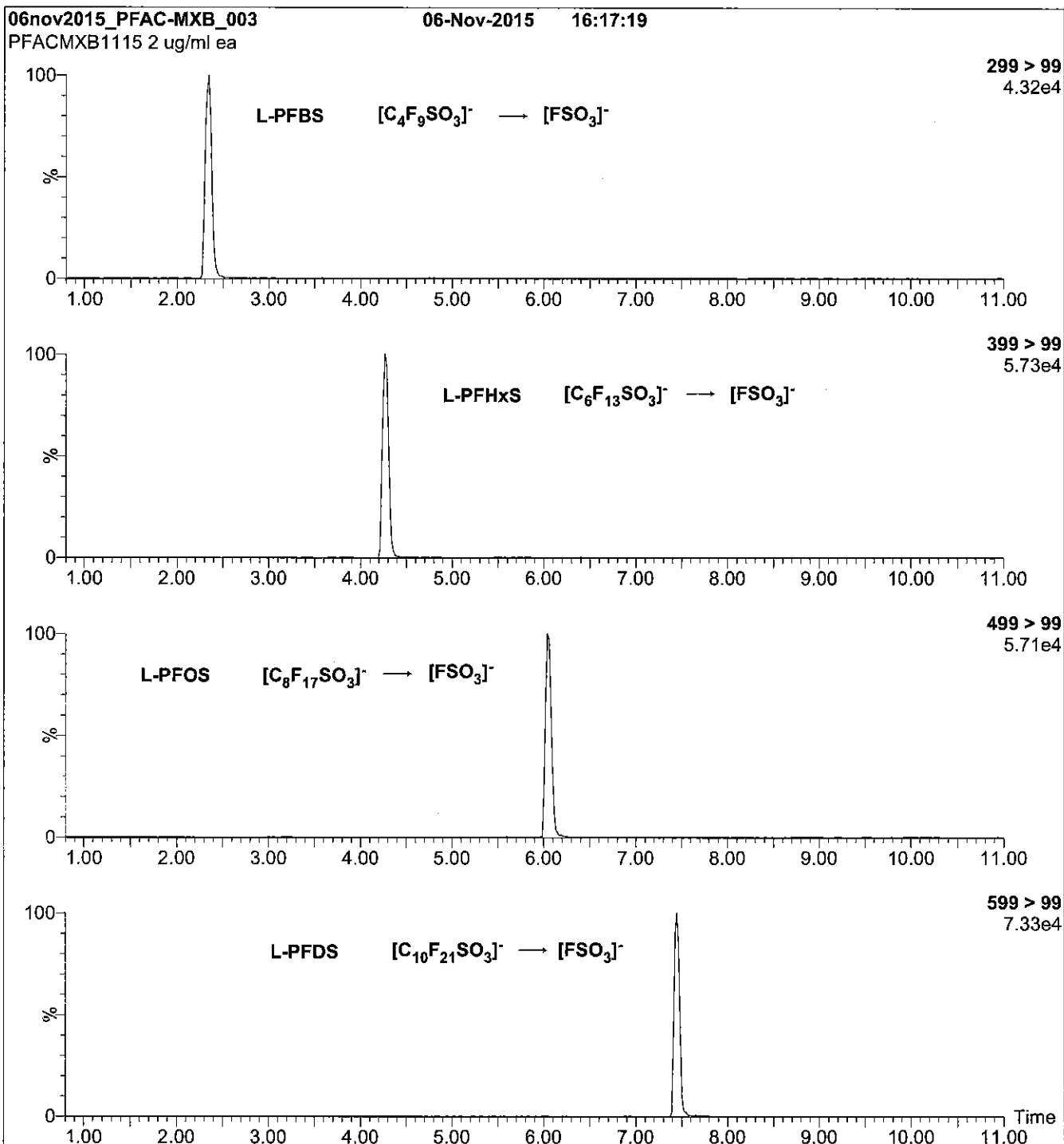


**Figure 3: PFAC-MXB; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figures 2 and 3:**

Injection: on-column (PFAC-MXB)

Mobile phase: Same as Figure 1

Flow: 300  $\mu$ /min

**MS Parameters**

Collision Gas (mbar) = 3.24e-3

Collision Energy (eV) = 8-50 (variable)



Reagent

---

**LCPFBA\_00005**

Scanned  
10/16/14

R: SBC 9/13/16



730531  
ID: LCPFBFA\_00005  
Exp: 05/27/21 Ppd: SBC  
PF-n-butanoic acid



730532  
ID: LCPFBFA\_00006  
Exp: 05/27/21 Ppd: SBC  
PF-n-butanoic acid



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:**

PFBA

**LOT NUMBER:**

PFBA0516

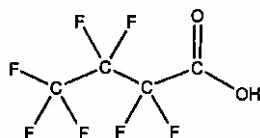
**COMPOUND:**

Perfluoro-n-butanoic acid

**STRUCTURE:**

**CAS #:**

375-22-4



**MOLECULAR FORMULA:**

C<sub>4</sub>HF<sub>7</sub>O<sub>2</sub>

**MOLECULAR WEIGHT:**

214.04

**CONCENTRATION:**

50 ± 2.5 µg/ml

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

05/27/2016

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

05/27/2021

**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:** 05/31/2016

(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.

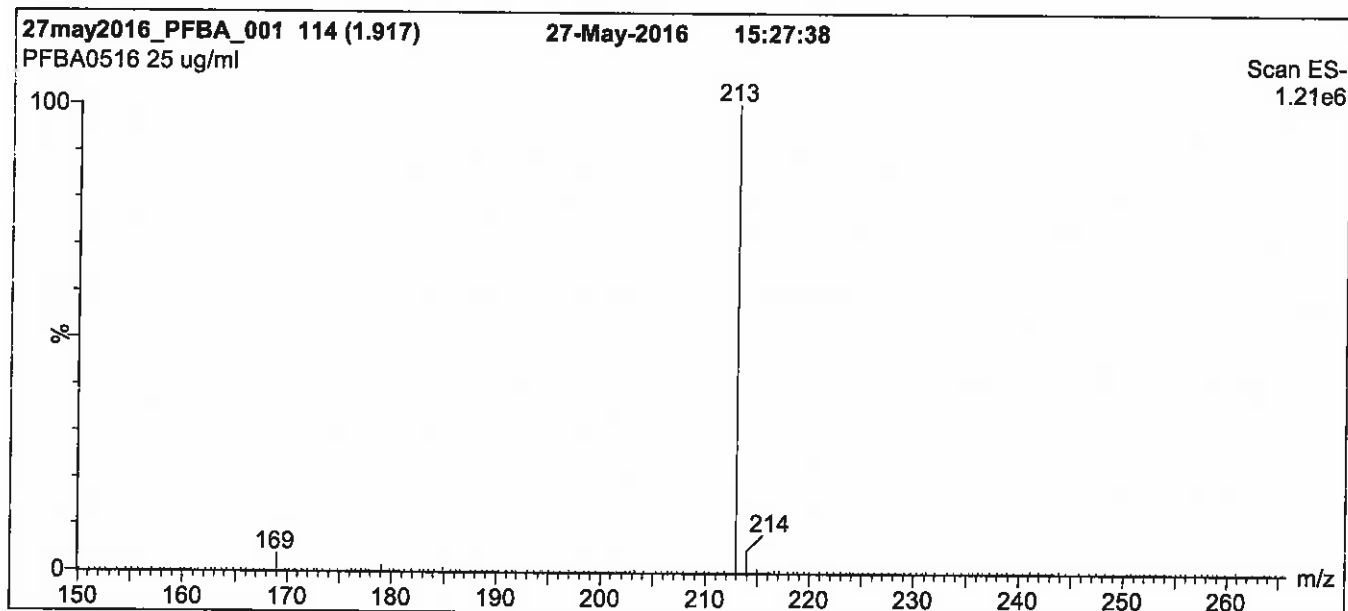
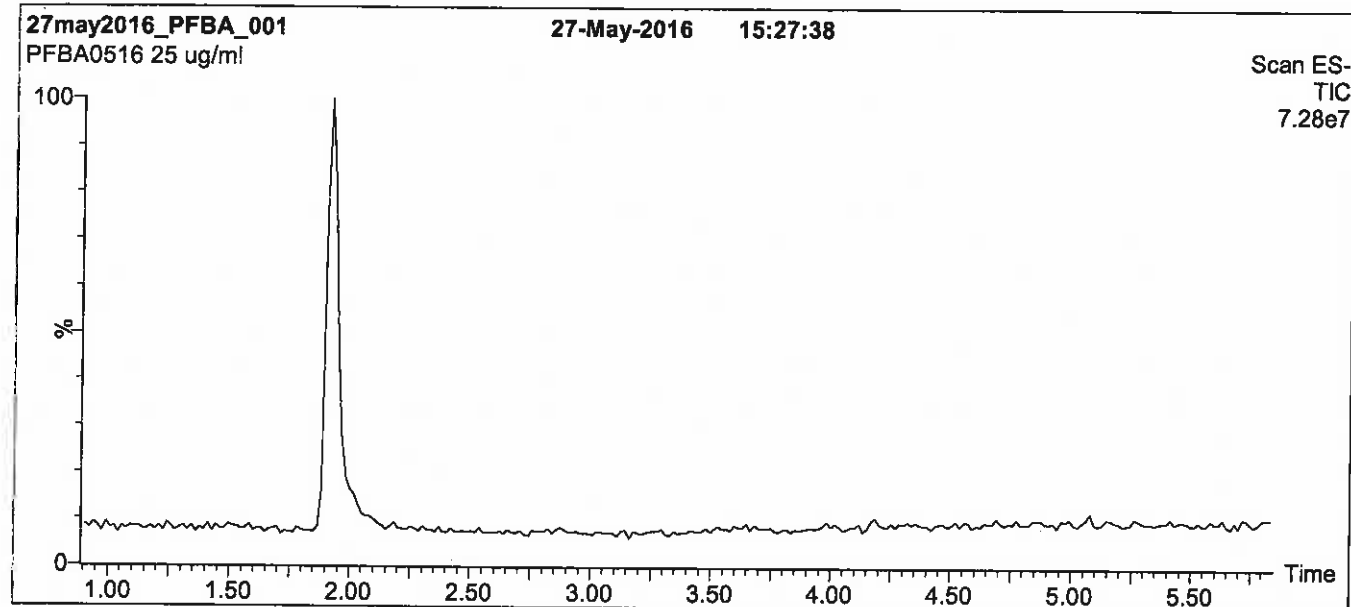
**QUALITY MANAGEMENT:**

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:** PFBA; 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: 30% (80:20 MeOH:ACN) / 70% 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

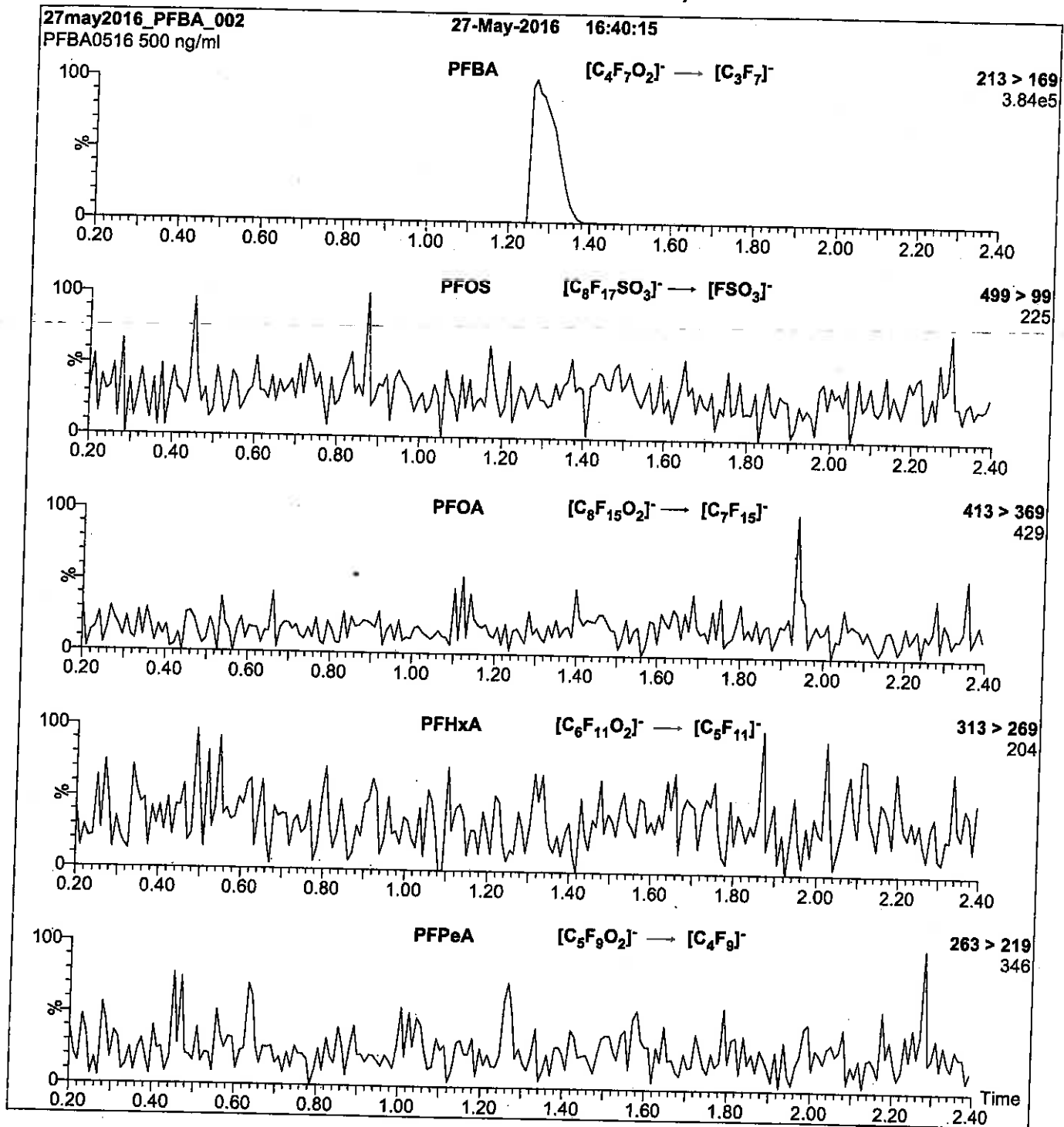
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 10.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.62e-3  
Collision Energy (eV) = 10

Reagent

---

**LCPFBS\_00005**

R: 7/9/16 gbx



728306

ID: LCM2-8:2FTS\_00003

Exp: 01/08/21 Prod: SBC

M2-8:2FTS

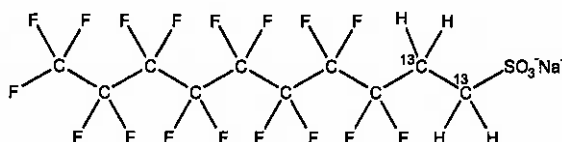


# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:** M2-8:2FTS **LOT NUMBER:** M282FTS0116  
**COMPOUND:** Sodium 1H,1H,2H,2H-perfluoro-[1,2-<sup>13</sup>C<sub>2</sub>]decane sulfonate

**STRUCTURE:** **CAS #:** Not available



**MOLECULAR FORMULA:** <sup>13</sup>C<sub>2</sub><sup>12</sup>C<sub>8</sub>H<sub>4</sub>F<sub>17</sub>SO<sub>3</sub>Na **MOLECULAR WEIGHT:** 552.15  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (Na salt) **SOLVENT(S):** Methanol  
47.9 ± 2.4 µg/ml (M2-8:2FTS anion)  
**CHEMICAL PURITY:** >98% **ISOTOPIC PURITY:** ≥99% <sup>13</sup>C  
**LAST TESTED:** (mm/dd/yyyy) 01/08/2016 (1,2-<sup>13</sup>C<sub>2</sub>)  
**EXPIRY DATE:** (mm/dd/yyyy) 01/08/2021  
**RECOMMENDED STORAGE:** Refrigerate ampoule

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

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

Certified By:

B.G. Chittim

Date: 01/18/2016

(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:**

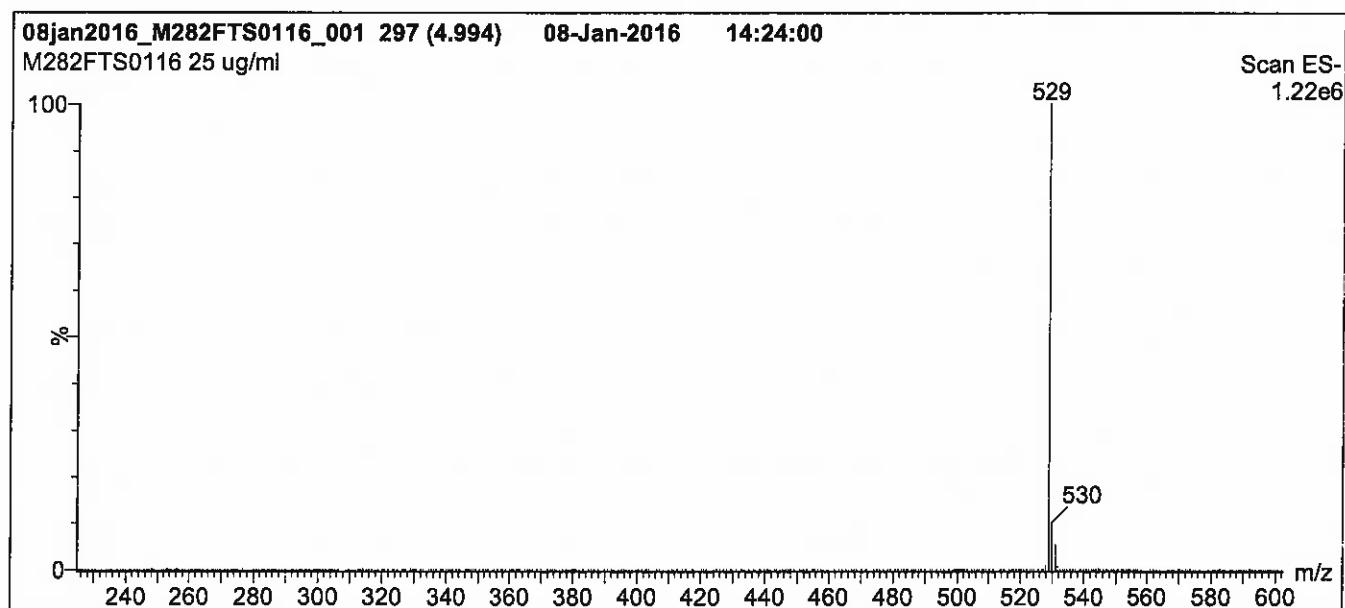
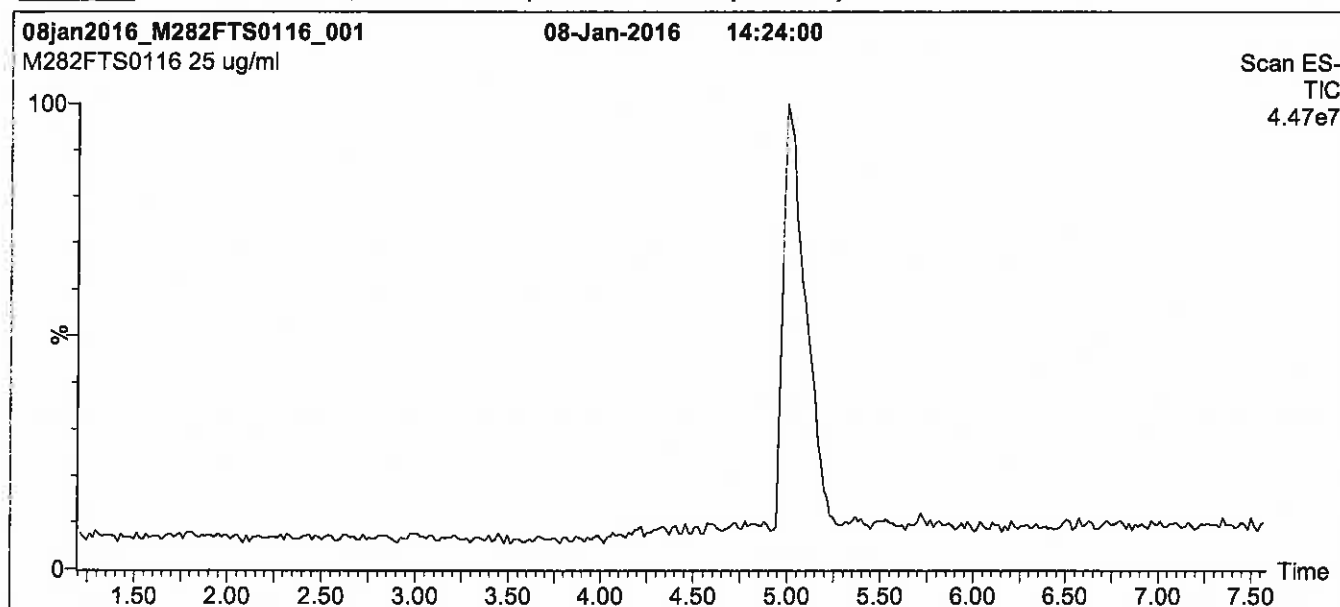
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*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: M2-8:2FTS; 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.

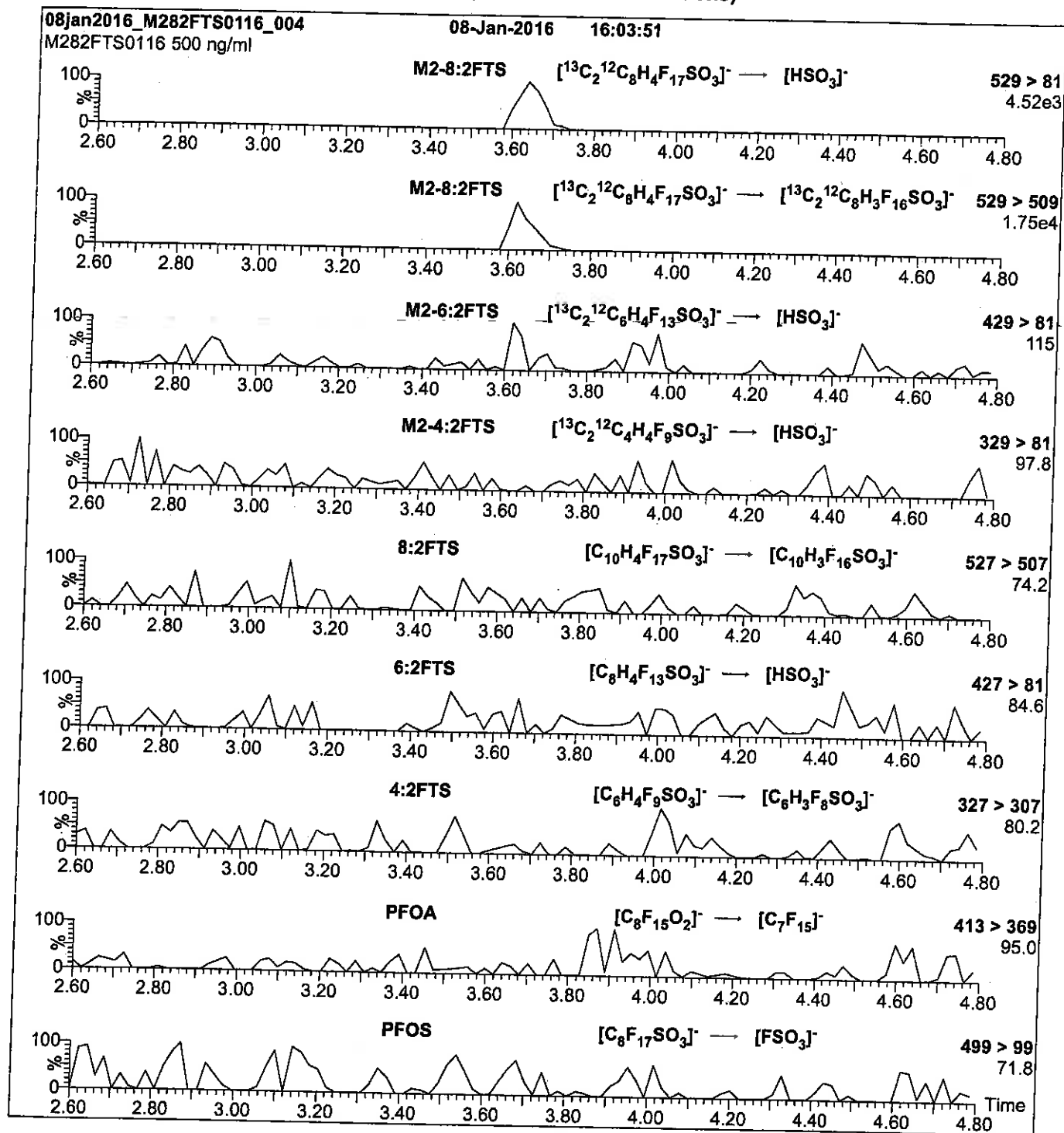
Time: 10 min  
**Flow:** 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 30.00  
Cone Gas Flow (l/hr) = 100  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu\text{l}$  (500 ng/ml M2-8:2FTS)

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) = 3.20e-3  
Collision Energy (eV) = 30

R: SBC 9/13/16



730511

ID: LCPFB5\_00005

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



730512

ID: LCPFB5\_00006

Exp: 03/15/21 Pripd: SBC

PF-1-butanedisulfonate K sa



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

L-PFBS

**LOT NUMBER:**

LPFB50316

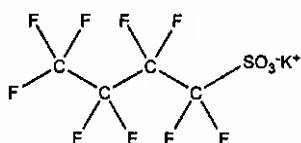
**COMPOUND:**

Potassium perfluoro-1-butanedisulfonate

**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)  
44.2 ± 2.2 µg/ml (PFBS anion)

**SOLVENT(S):**

Methanol

**CHEMICAL PURITY:**

>98%

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

03/15/2016

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

03/15/2021

**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.

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

Certified By:

B.G. Chittim

Date: 03/21/2016

(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.

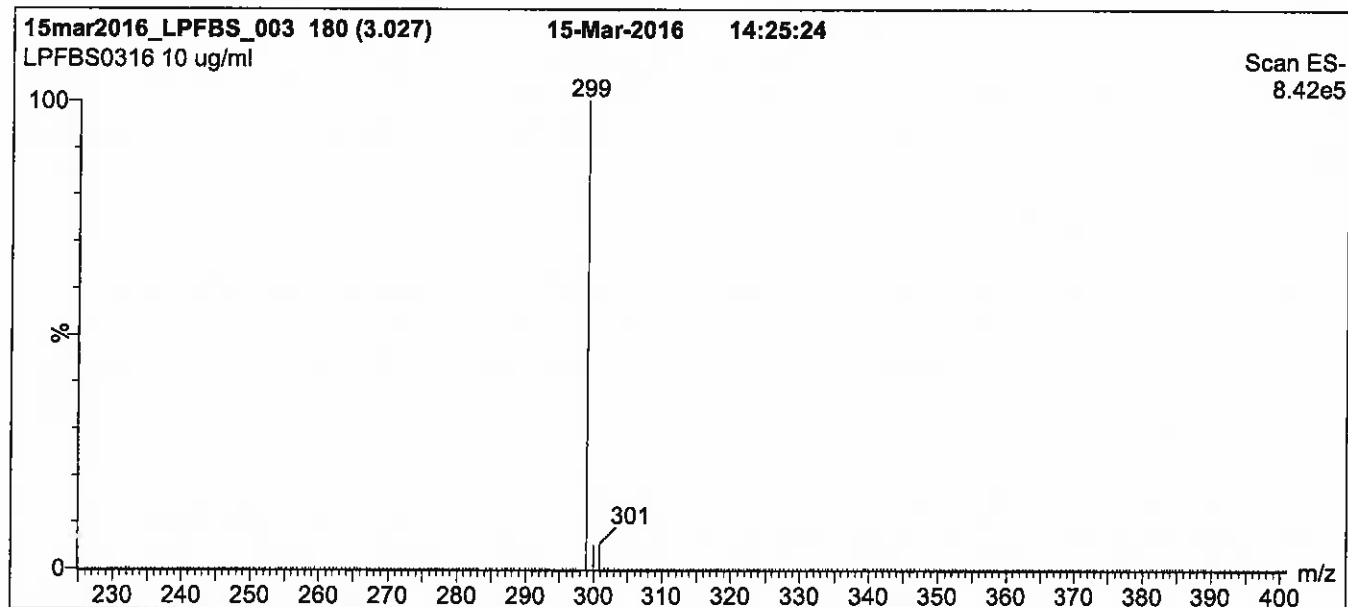
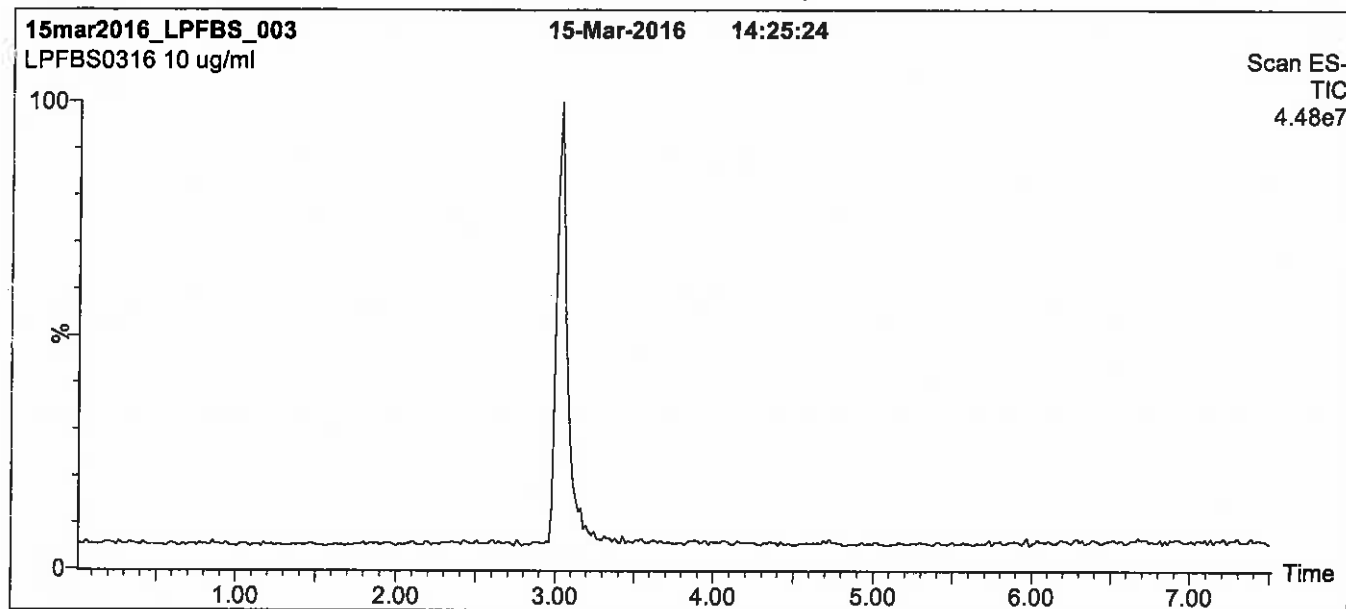
**QUALITY MANAGEMENT:**

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: 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 1.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

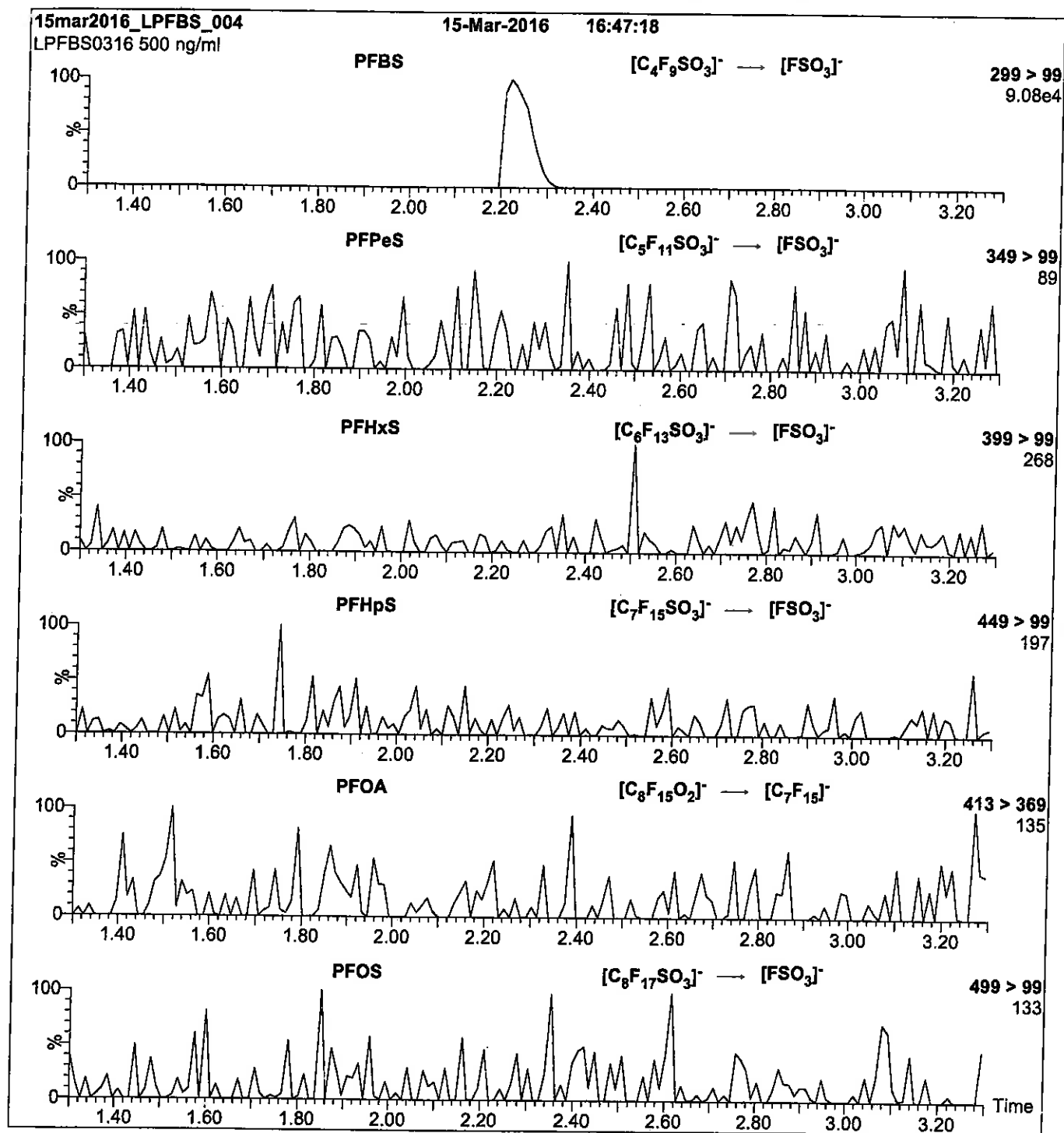
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 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<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.20e-3  
Collision Energy (eV) = 25

Reagent

---

**LCPFDA\_00005**

R: 7/16/16 CBW



671576

ID: LCPFDA\_00305

Exp: 07/02/20 Ppdt: CBW

PF-n-decanoic acid



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:**

PFDA

**LOT NUMBER:**

PFDA0615

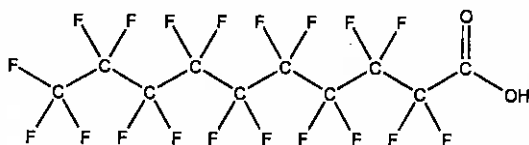
**COMPOUND:**

Perfluoro-n-decanoic acid

**STRUCTURE:**

**CAS #:**

335-76-2



**MOLECULAR FORMULA:**

$C_{10}H_{19}O_2$

**MOLECULAR WEIGHT:**

514.08

**CONCENTRATION:**

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

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

07/02/2015

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

07/02/2020

**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 ~ 0.6% PFNA and ~ 0.3% PFOA.

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

**Certified By:**

B.G. Chittim

**Date:** 07/24/2015

(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.

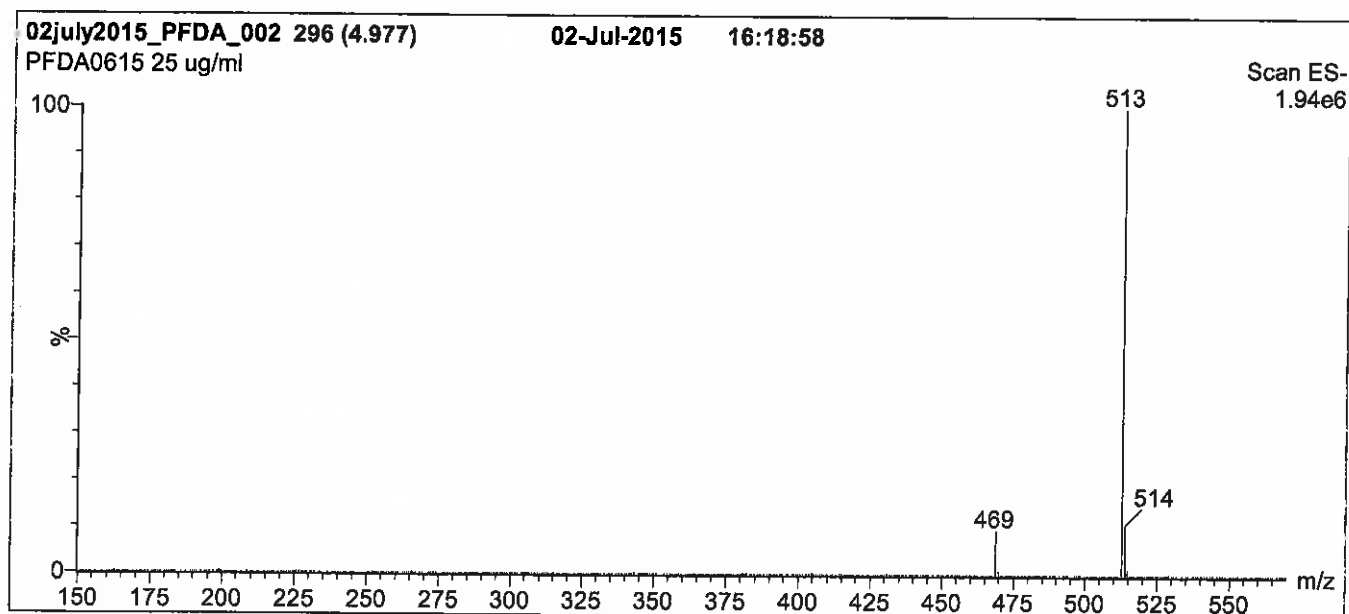
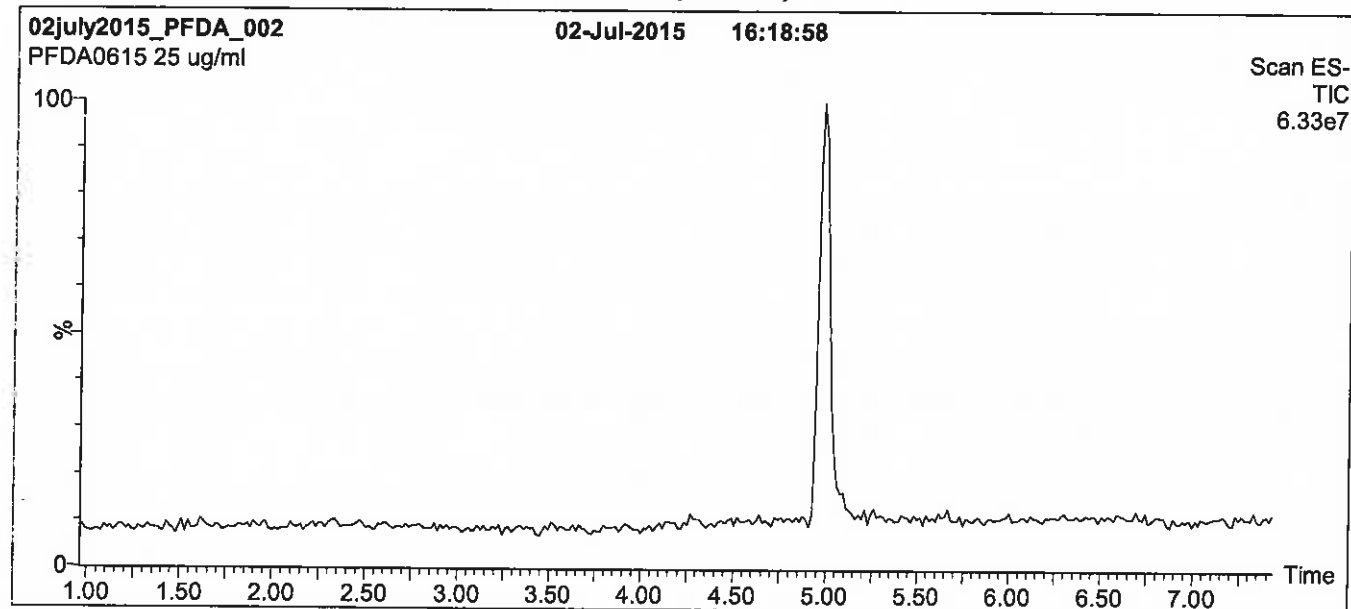
**QUALITY MANAGEMENT:**

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: PFDA; 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

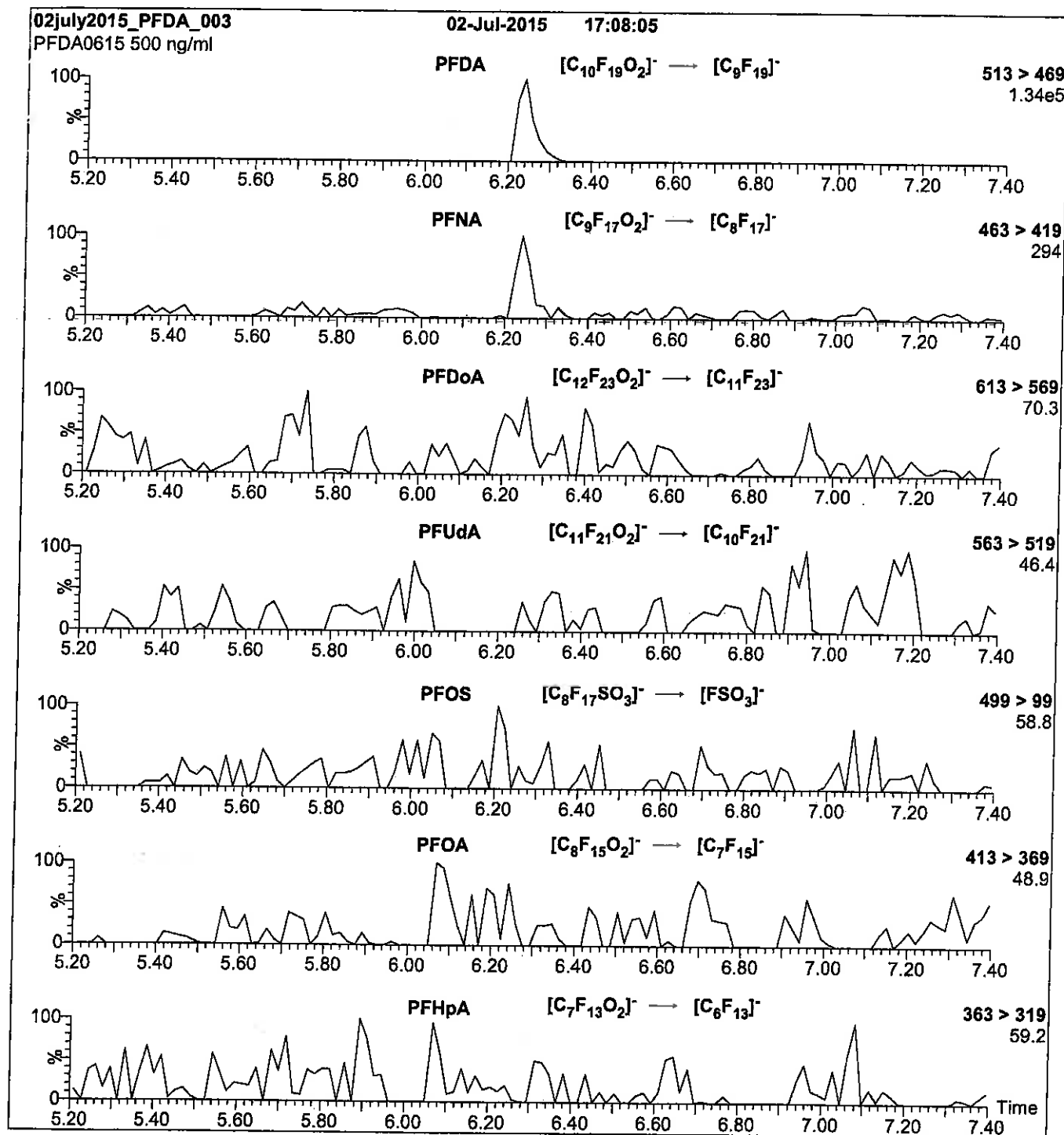
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (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: PFDA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

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

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) = 3.62e-3  
Collision Energy (eV) = 13

Reagent

---

**LCPFDoA\_00005**

R: 7/6/16 car

671601  
ID: LCPFDaA\_00005  
Exp: 01/30/20 Pripd: CSW  
PF-n-dodecanoic acid

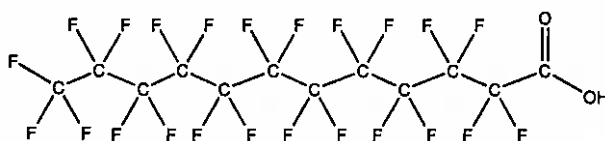


**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:** PFDaA **LOT NUMBER:** PFDaA0115  
**COMPOUND:** Perfluoro-n-dodecanoic acid

**STRUCTURE:** **CAS #:** 307-55-1



**MOLECULAR FORMULA:**  $C_{12}H_{23}O_2$  **MOLECULAR WEIGHT:** 614.10  
**CONCENTRATION:**  $50 \pm 2.5 \mu\text{g/ml}$  **SOLVENT(S):** Methanol  
Water (<1%)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 01/30/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 01/30/2020  
**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:** 03/25/2015  
(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.

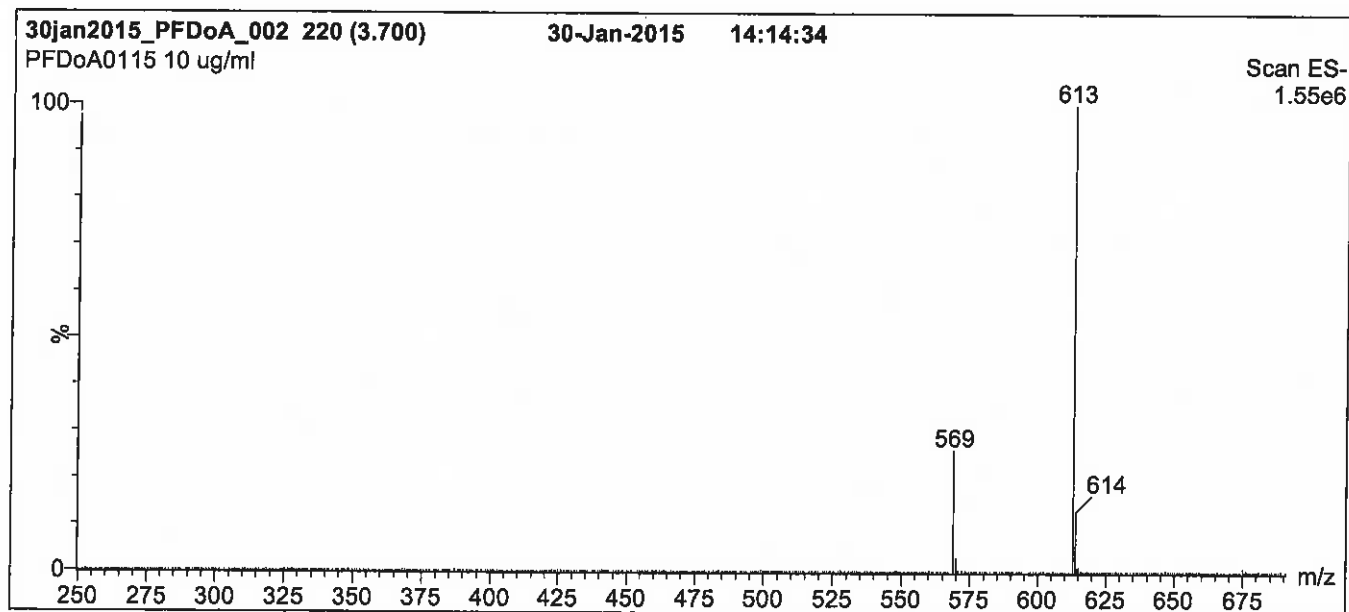
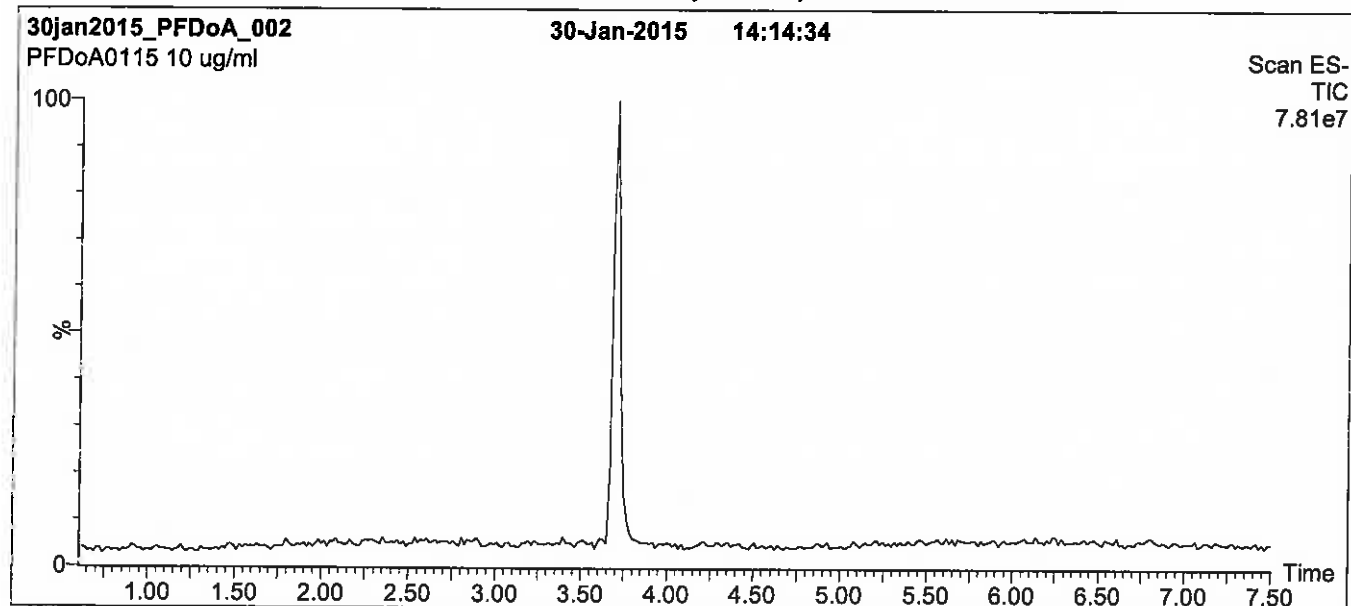
**QUALITY MANAGEMENT:**

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: PFD<sub>o</sub>A; 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: 60% (80:20 MeOH:ACN) / 40% 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

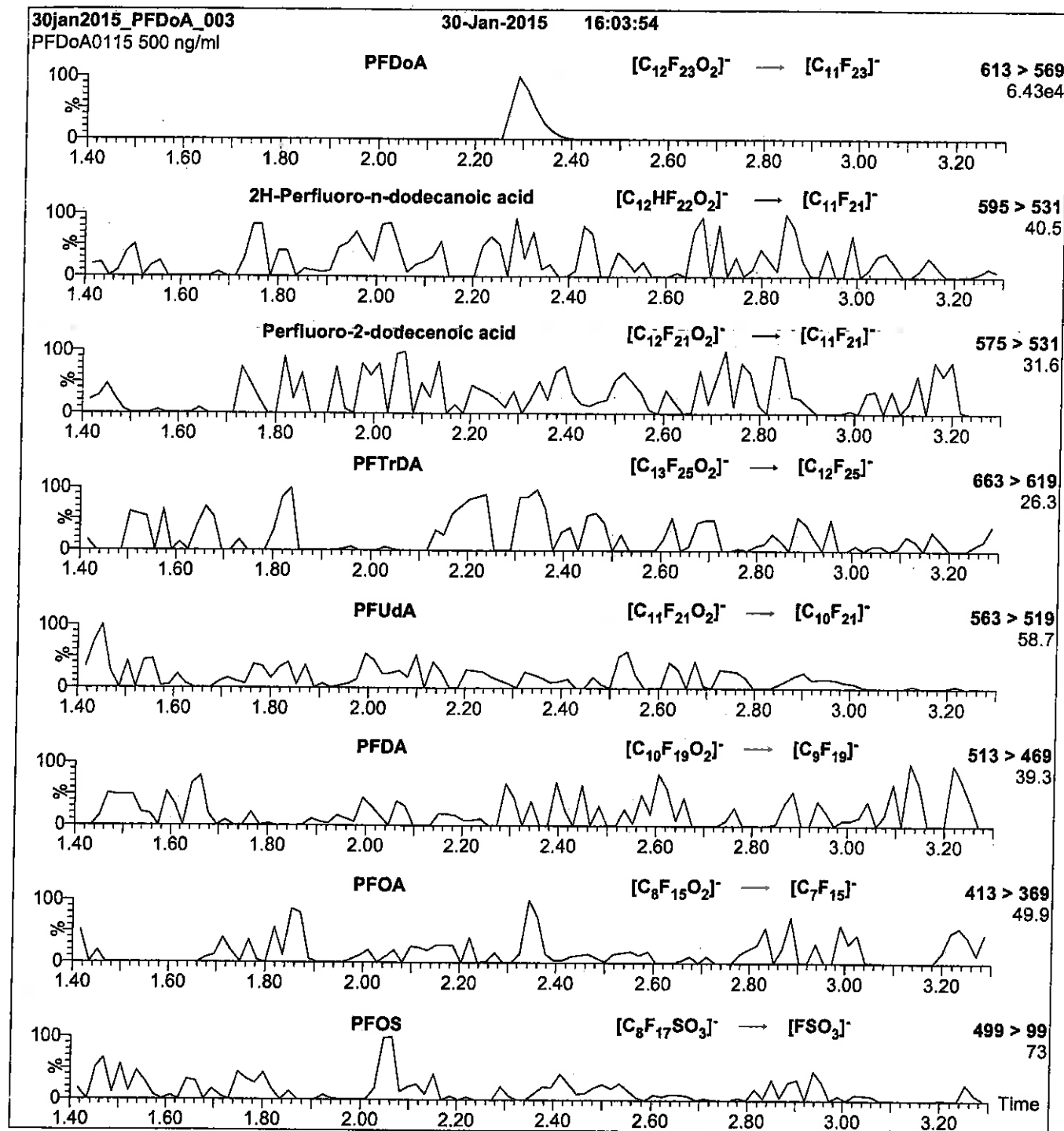
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (250 - 1000 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 2.00  
**Cone Voltage (V)** = 20.00  
**Cone Gas Flow (l/hr)** = 100  
**Desolvation Gas Flow (l/hr)** = 750

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



**Conditions for Figure 2:**

Injection: Direct loop injection  
10  $\mu$ l (500 ng/ml PFD0A)

**MS Parameters**

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

Collision Gas (mbar) = 3.28e-3  
Collision Energy (eV) = 13

Flow: 300  $\mu$ l/min



Reagent

---

**LCPFHpA\_00006**

Scanned R: SBC 9/13/16  
10/14/16 JK



730517  
ID: LCPFHpa\_00006  
Exp: 01/22/21 Prpd: SBC  
PF-n-heptanoic acid



730518  
ID: LCPFHpa\_00007  
Exp: 01/22/21 Prpd: SBC  
PF-n-heptanoic acid



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFHpA

**LOT NUMBER:**

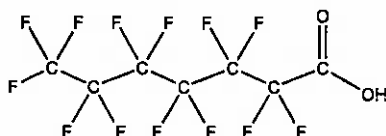
PFHpA0116

**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 (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

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

01/22/2016

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

01/22/2021

**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.

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

Certified By:

  
B.G. Chittim

Date: 02/02/2016

(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.

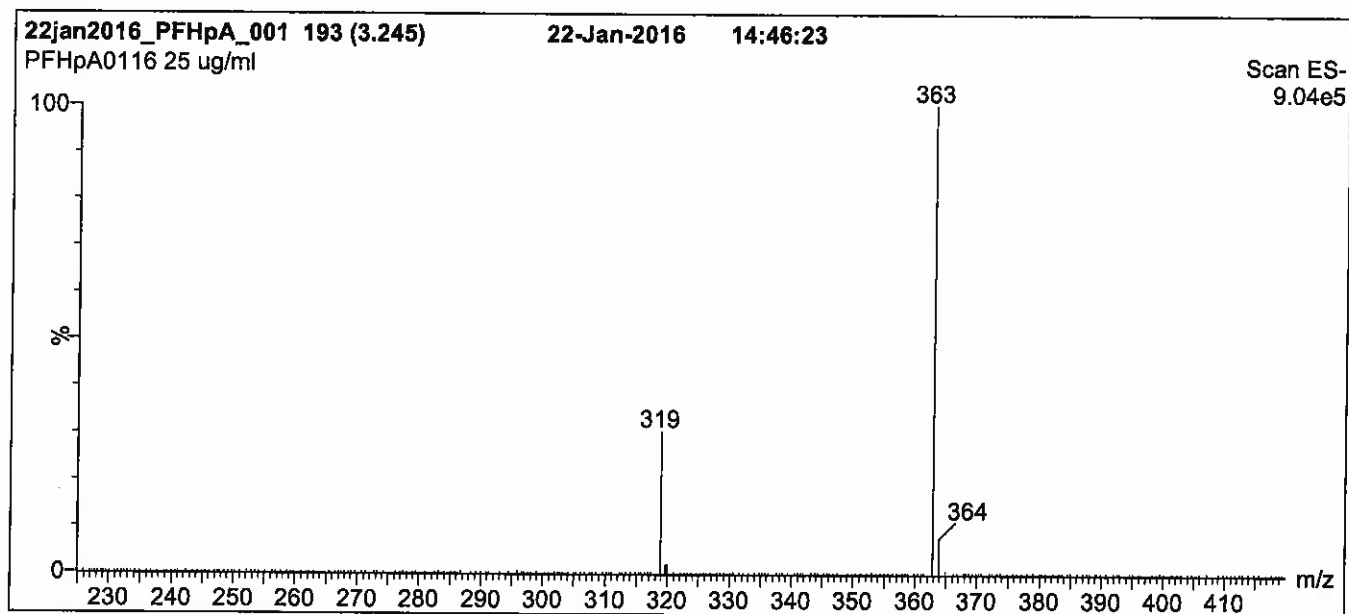
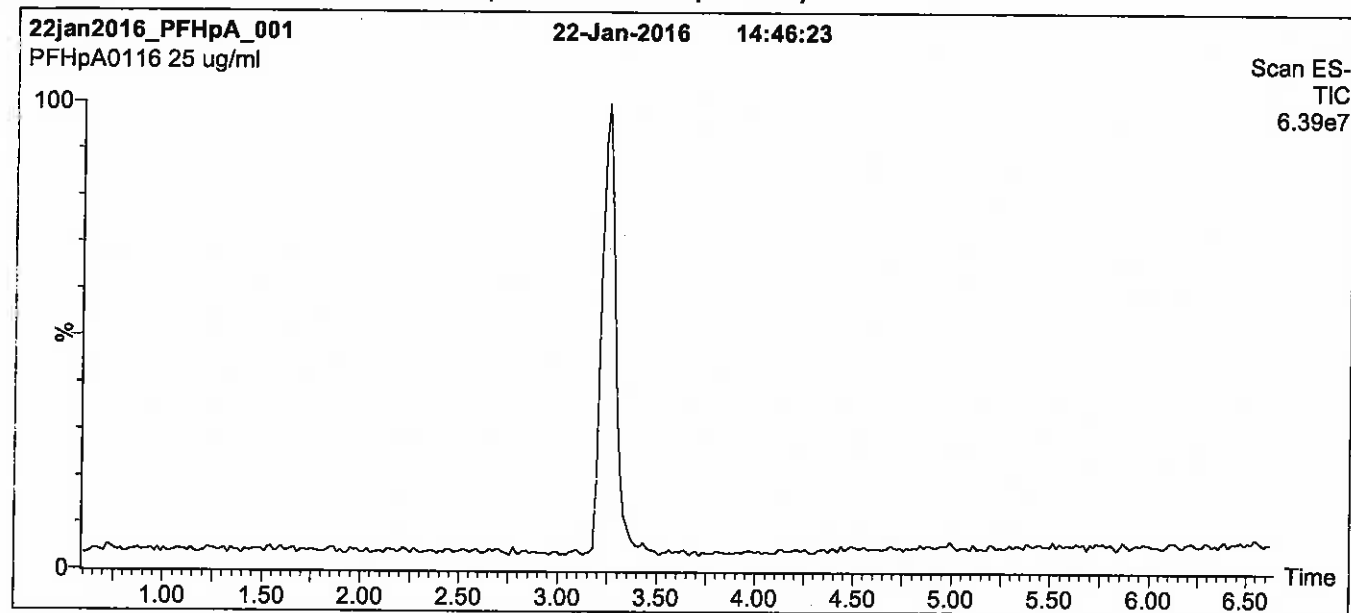
### **QUALITY MANAGEMENT:**

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: 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: 55% (80:20 MeOH:ACN) / 45% 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

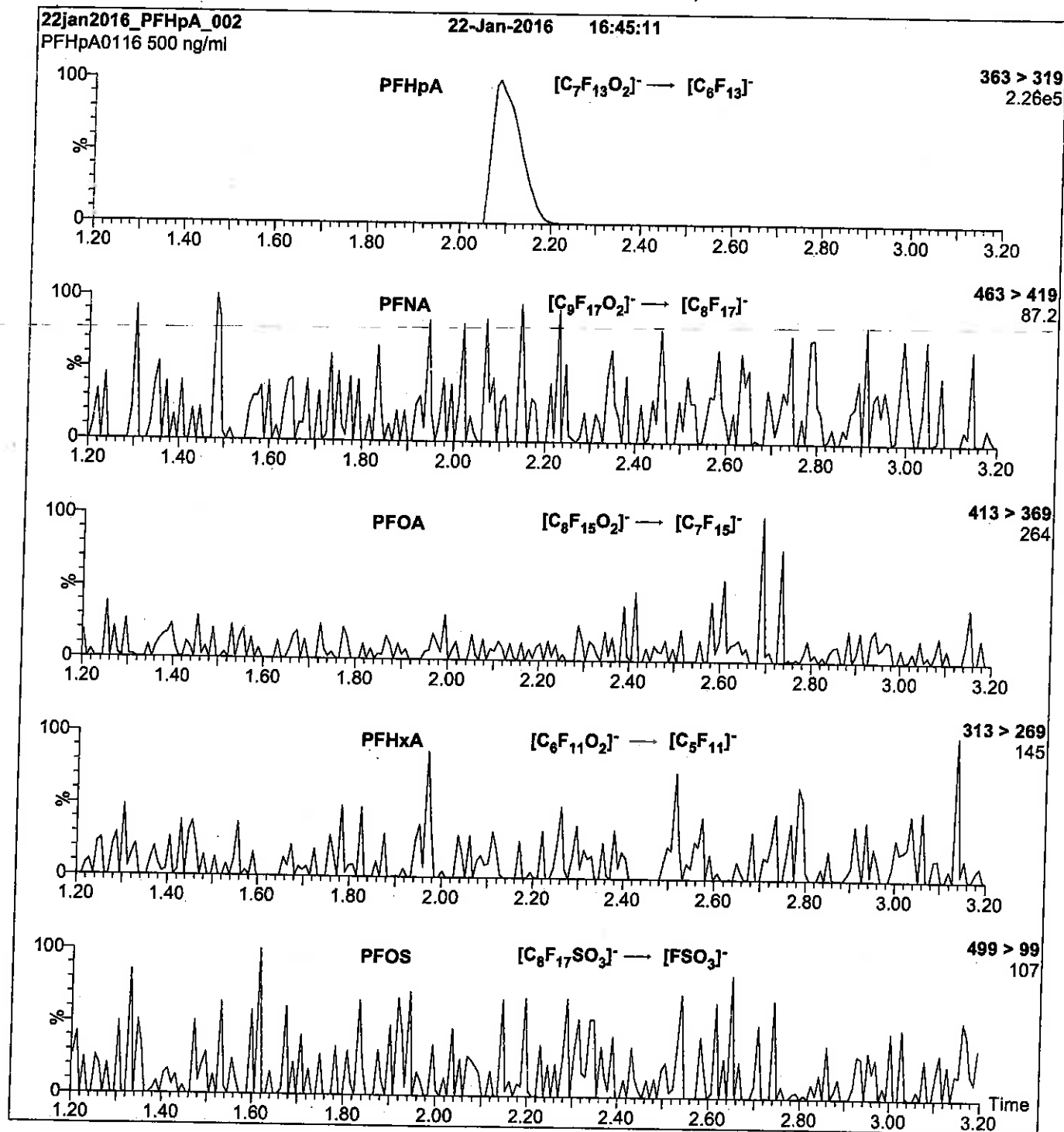
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 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

---

**LCPFHpS\_00009**

Scanned  
10/14/16 SP  
R: SBC 9/13/16

730635  
ID: LCPFHPS\_00009  
Exp: 11/06/20 Prod: SBC  
PFHpS at 47.6ug/mL

730639  
ID: LCPFHPS\_00010  
Exp: 11/06/20 Prod: SBC  
PFHpS at 47.6ug/mL



**WELLINGTON**  
LABORATORIES

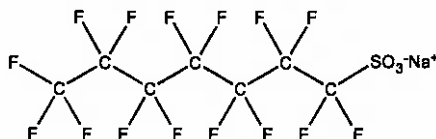
**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:** L-PFHPS  
**COMPOUND:** Sodium perfluoro-1-heptanesulfonate

**LOT NUMBER:** LPFHPS1115

**STRUCTURE:**

**CAS #:** Not available



**MOLECULAR FORMULA:**  $C_7F_{15}SO_3Na$   
**CONCENTRATION:**  $50.0 \pm 2.5 \mu g/mL$  (Na salt)  
 $47.6 \pm 2.4 \mu g/mL$  (PFHpS anion)  
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 11/06/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 11/06/2020  
**RECOMMENDED STORAGE:** Store ampoule in a cool, dark place

**MOLECULAR WEIGHT:** 472.10  
**SOLVENT(S):** Methanol

**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 ~ 0.1% of L-PFHxS ( $C_6F_{13}SO_3Na$ ) and ~ 0.2% of L-PFOS ( $C_8F_{17}SO_3Na$ ).

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

**Certified By:**

B.G. Chittim

**Date:** 11/09/2015  
(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:**

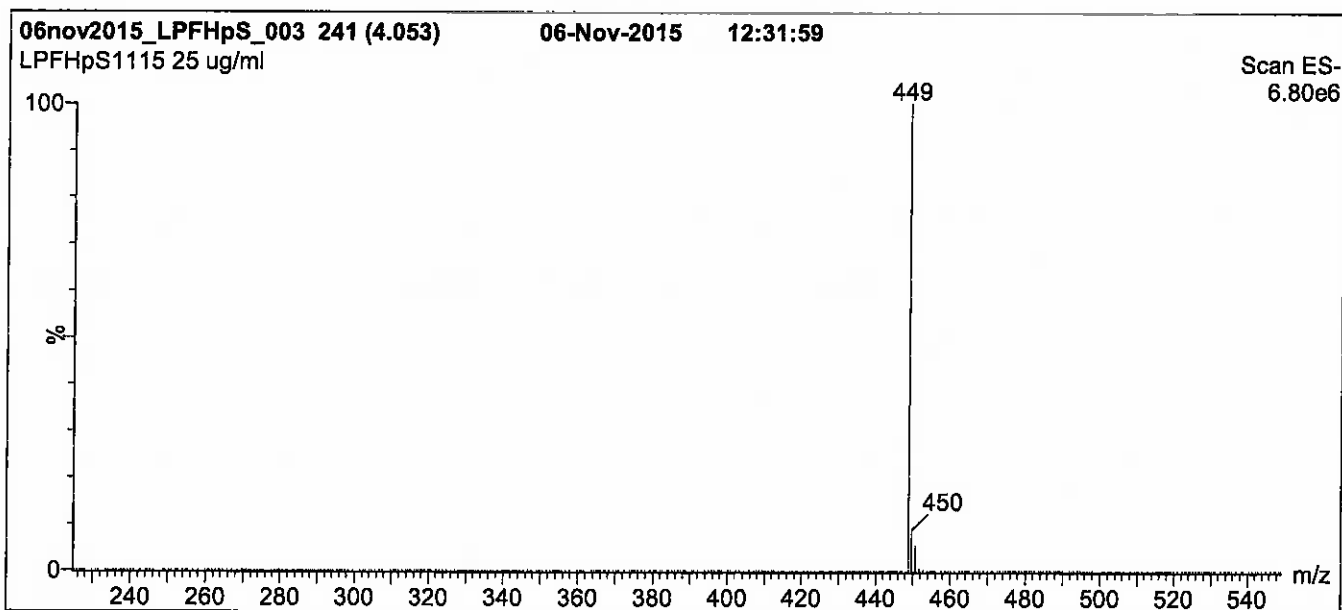
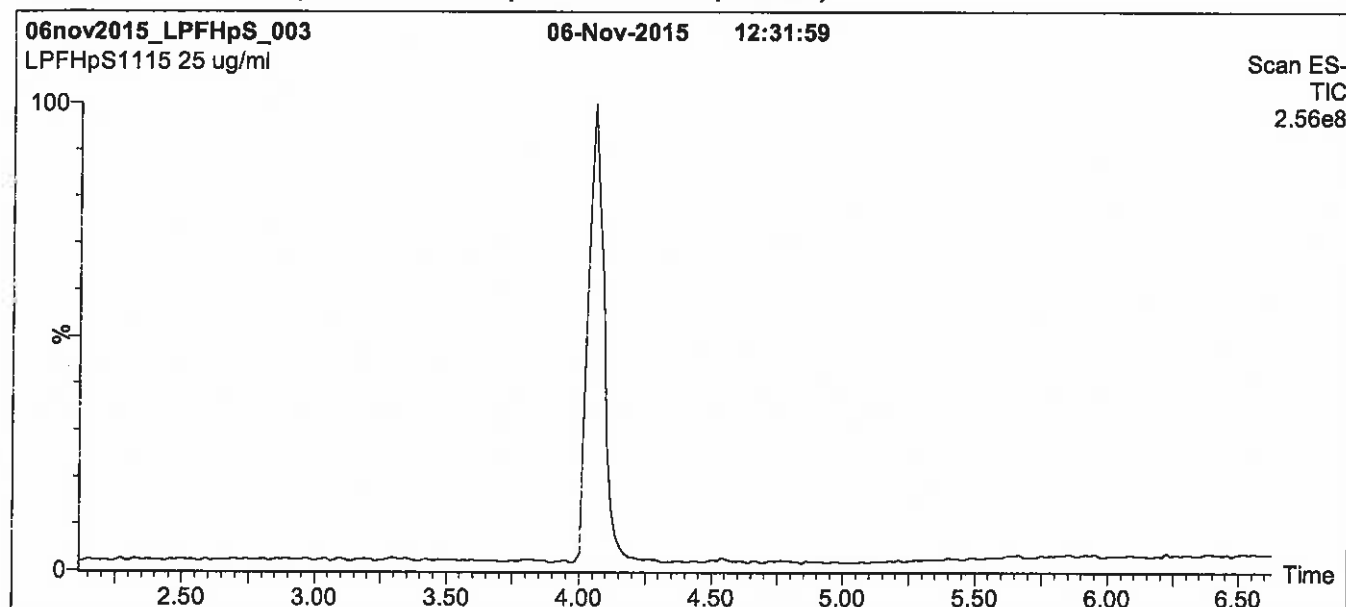
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



\*\*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: L-PFHpS; 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

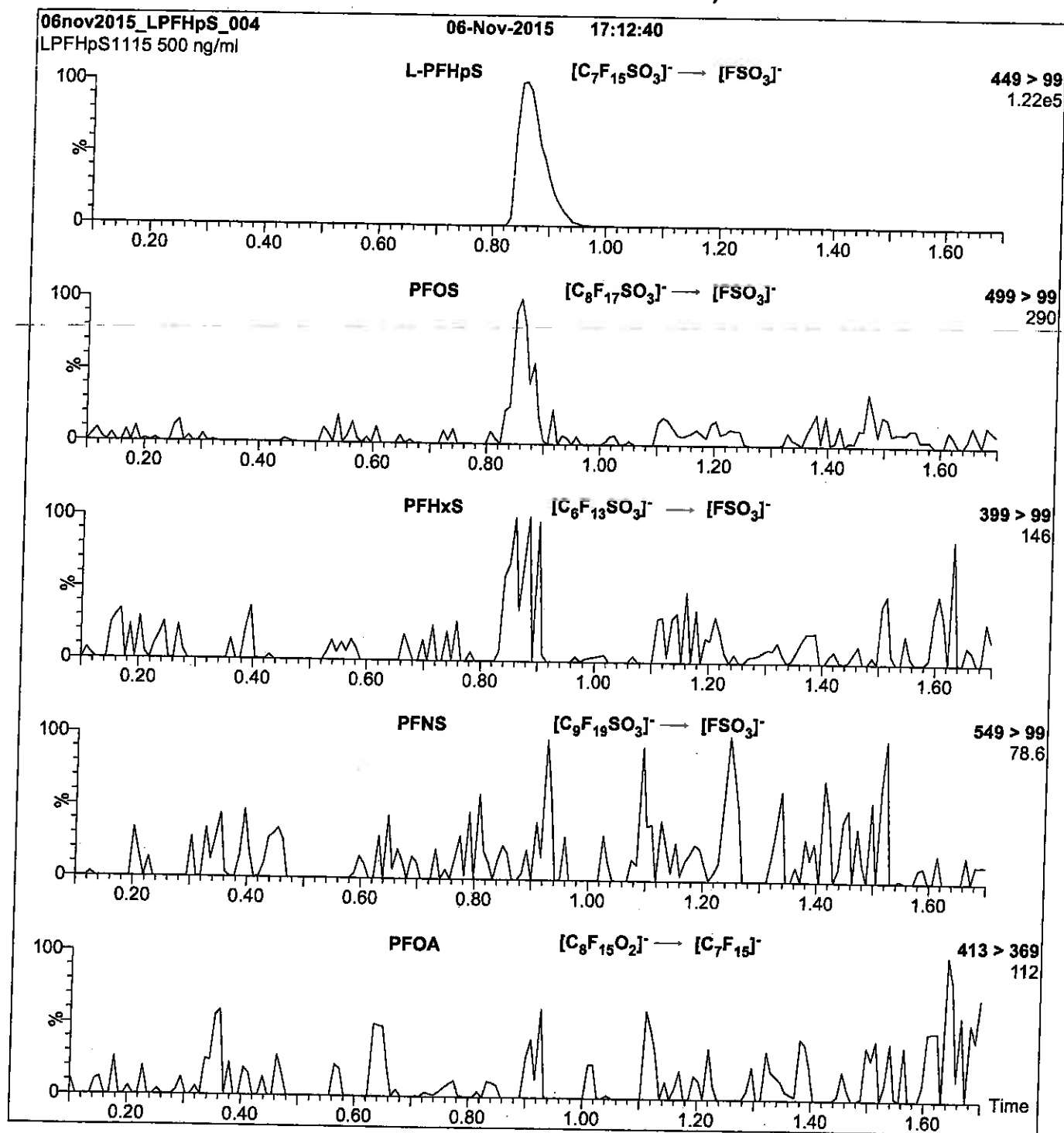
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 60.00  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.31e-3  
Collision Energy (eV) = 35

Reagent

---

**LCPFHxA\_00005**

R: 832 9/13/16



730551  
ID: LCPFHxA\_00005  
Exp: 12/22/20 Ppd: SBC  
PF-n-hexanoic acid



730552  
ID: LCPFHxA\_00006  
Exp: 12/22/20 Ppd: SBC  
PF-n-hexanoic acid



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFHxA

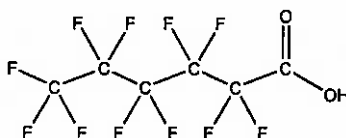
**LOT NUMBER:** PFHxA1215

**COMPOUND:**

Perfluoro-n-hexanoic acid

**STRUCTURE:**

**CAS #:** 307-24-4



**MOLECULAR FORMULA:**

$C_6H_5F_{11}O_2$

**MOLECULAR WEIGHT:** 314.05

**CONCENTRATION:**

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

**SOLVENT(S):** Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

12/22/2015

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

12/22/2020

**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 ~ 0.2% of Perfluoro-n-pentanoic acid (PFPeA).

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

Certified By:

B.G. Chittim

Date: 12/23/2015

(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:**

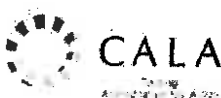
Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

**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.

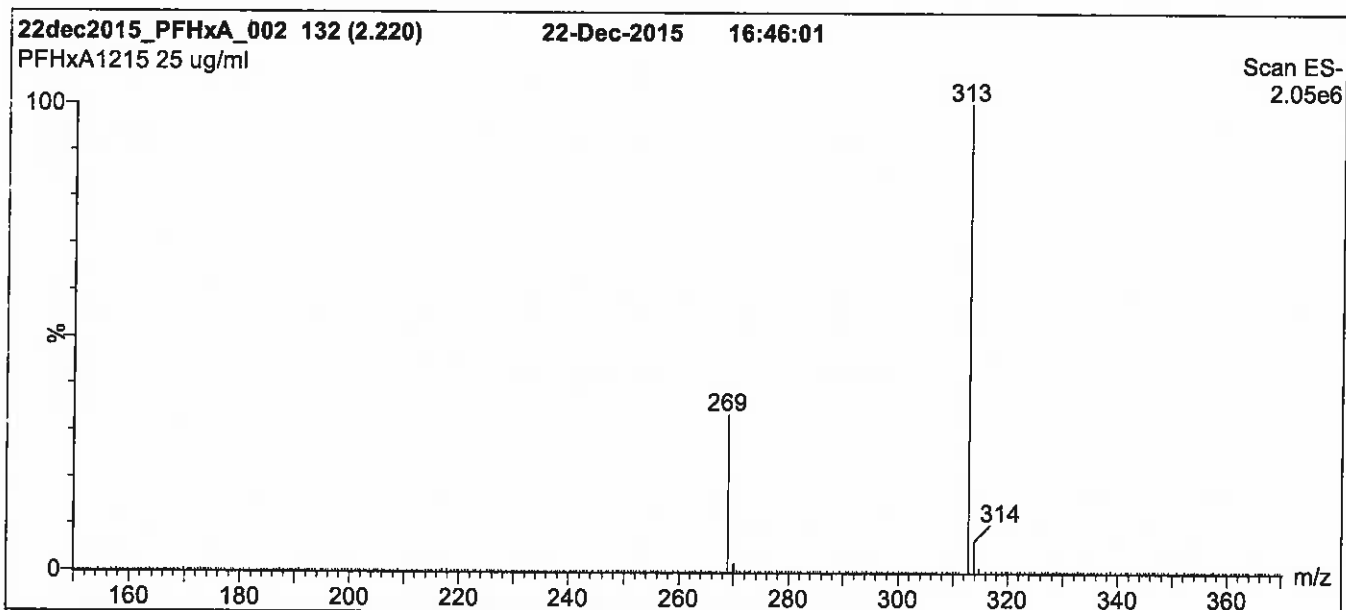
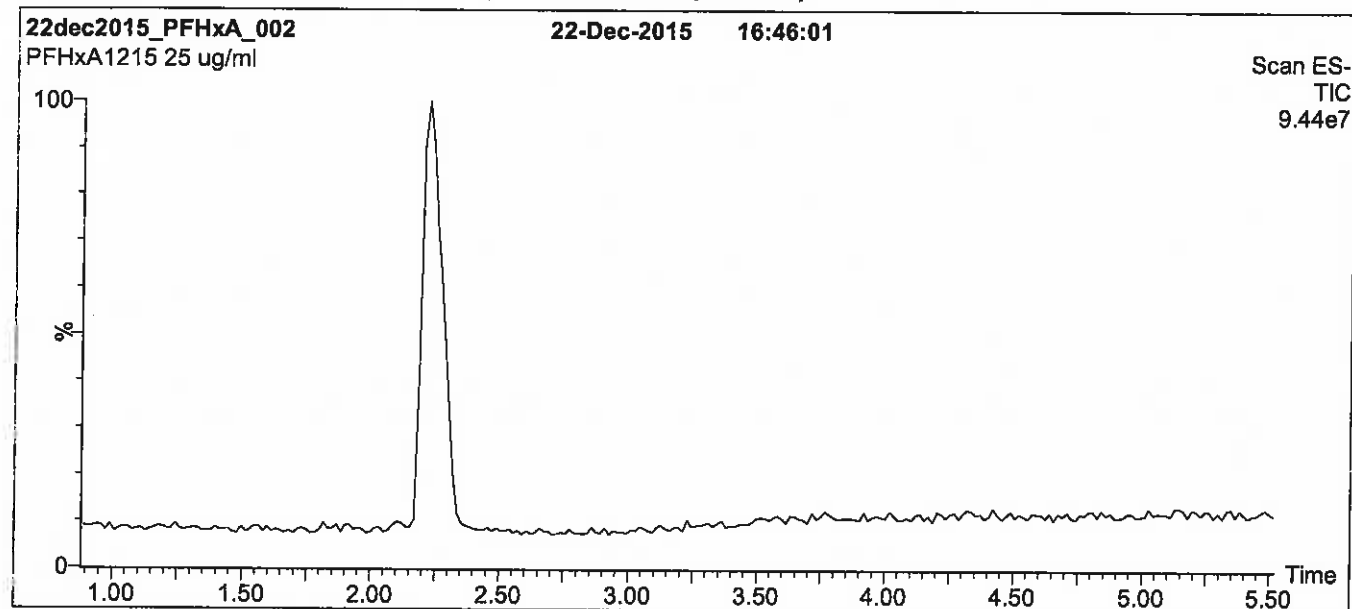
**QUALITY MANAGEMENT:**

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:** PFHxA; 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

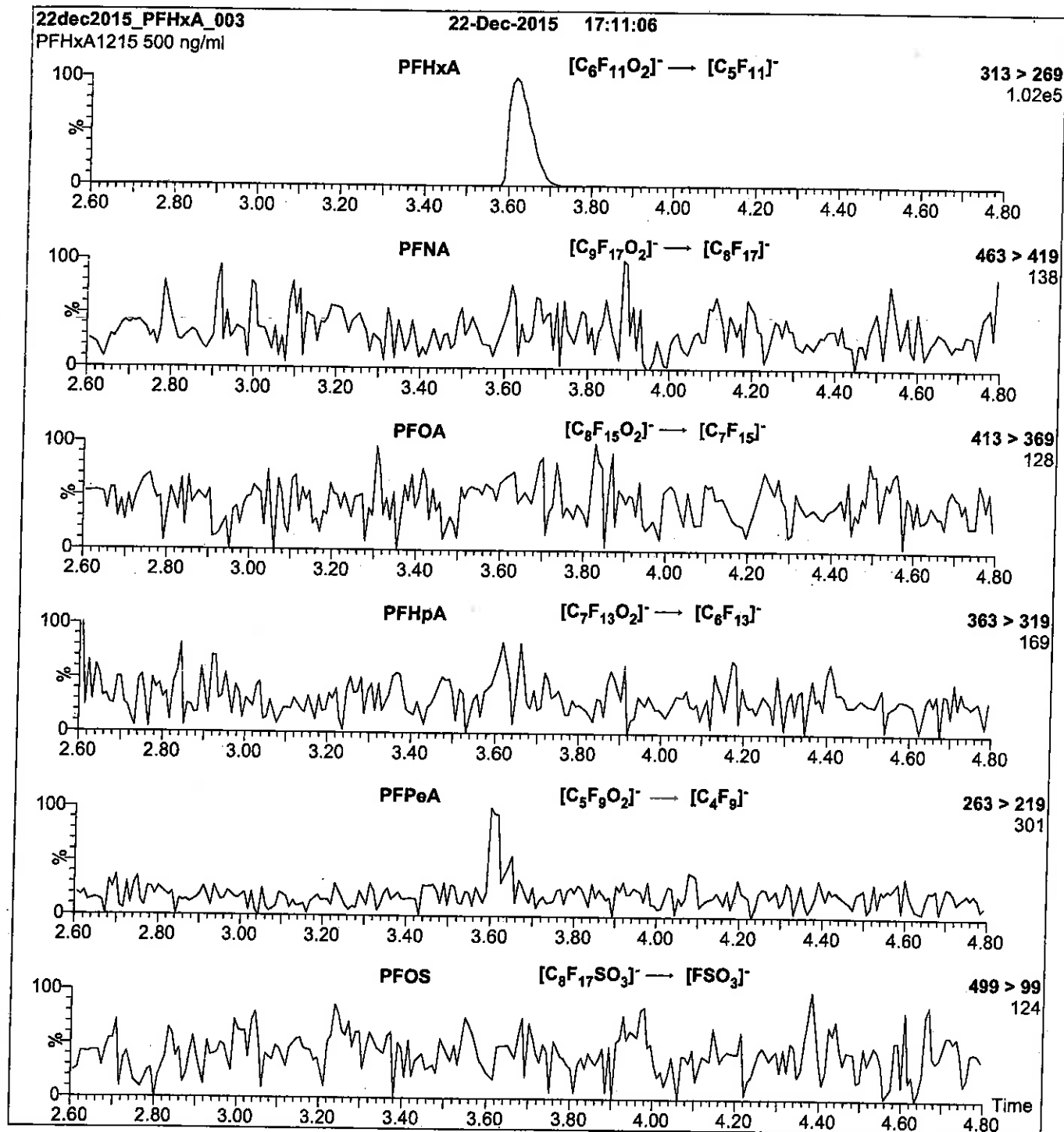
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (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: PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

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

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) = 3.43e-3  
Collision Energy (eV) = 10

Reagent

---

**LCPFHxDA\_00006**





WELLINGTON  
LABORATORIES



730630  
ID: LCPFHxDA\_00006  
Exp: 05/25/21 Prpd: SBC  
PFHxDA stock 50ug/mL



730631  
ID: LCPFHxDA\_00007  
Exp: 05/25/21 Prpd: SBC  
PFHxDA stock 50ug/mL

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFHxDA

**LOT NUMBER:**

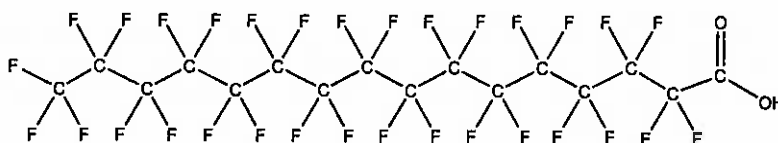
PFHxDA0516

**COMPOUND:**

Perfluoro-n-hexadecanoic acid

**STRUCTURE:****CAS #:**

67905-19-5

**MOLECULAR FORMULA:** $C_{16}H_{31}O_2$ **MOLECULAR WEIGHT:**

814.13

**CONCENTRATION:** $50 \pm 2.5 \mu\text{g/mL}$ **SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

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

05/25/2016

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

05/25/2021

**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 ~ 0.4% of PFODA.

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

Certified By:

  
B.G. Chittim

Date: 05/27/2016

(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.

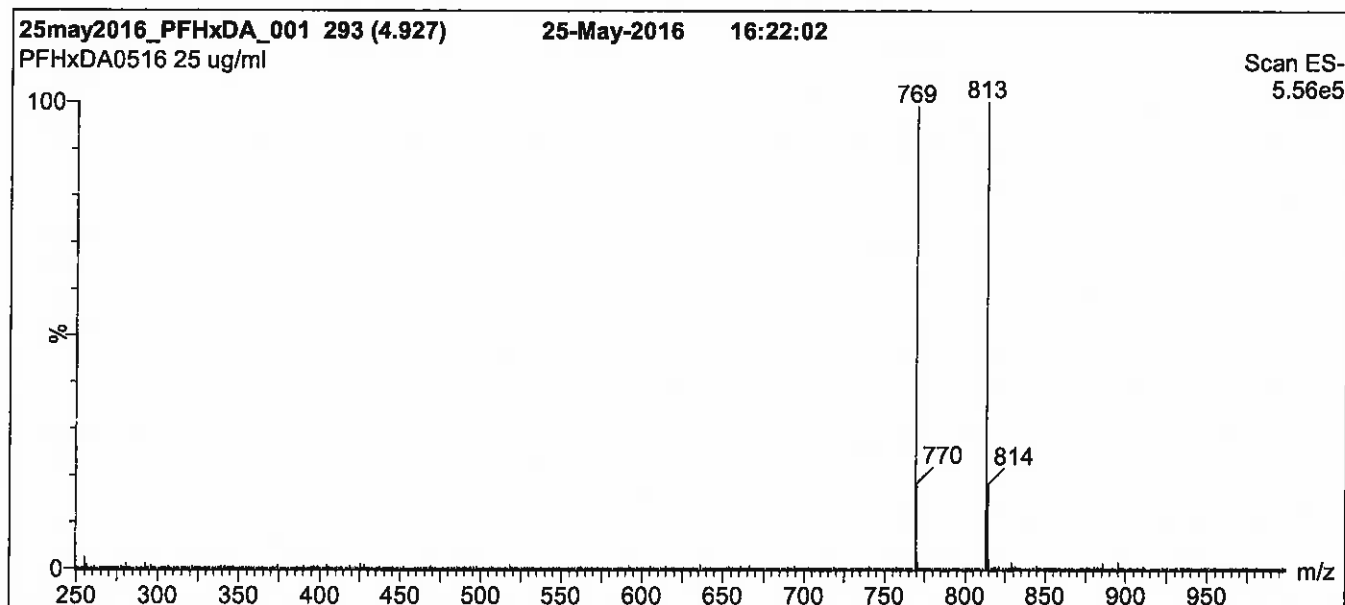
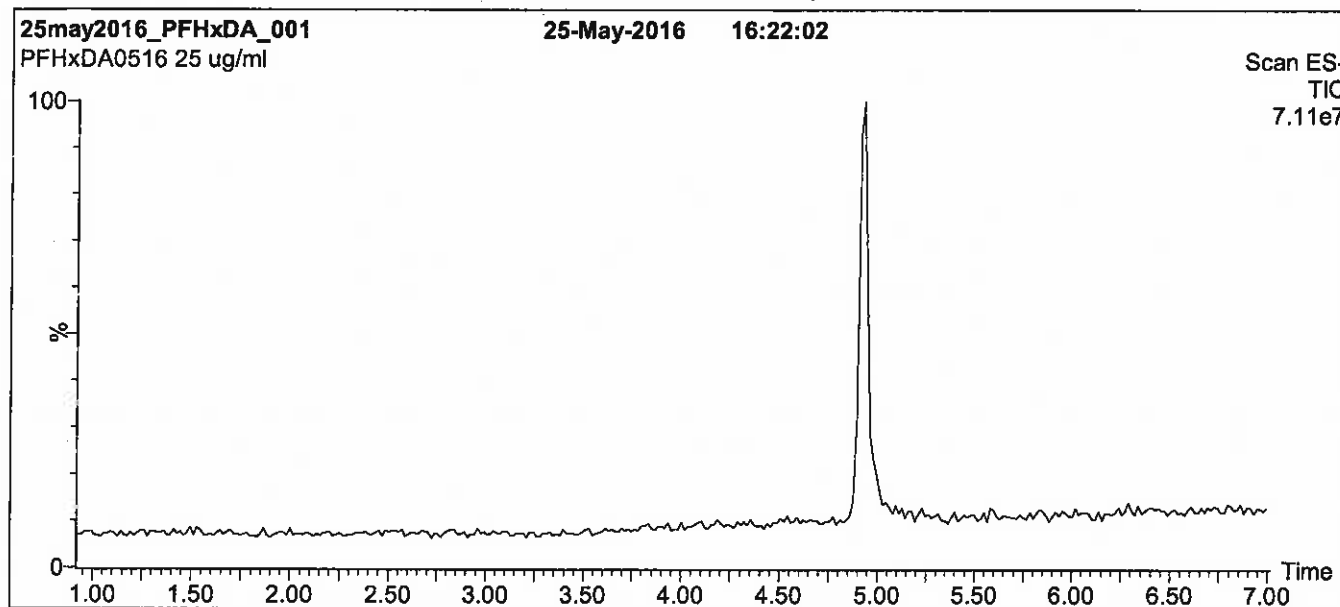
### **QUALITY MANAGEMENT:**

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: PFHxDA; 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: 70% (80:20 MeOH:ACN) / 30% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 95% organic over 6 min and hold for 2.5 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

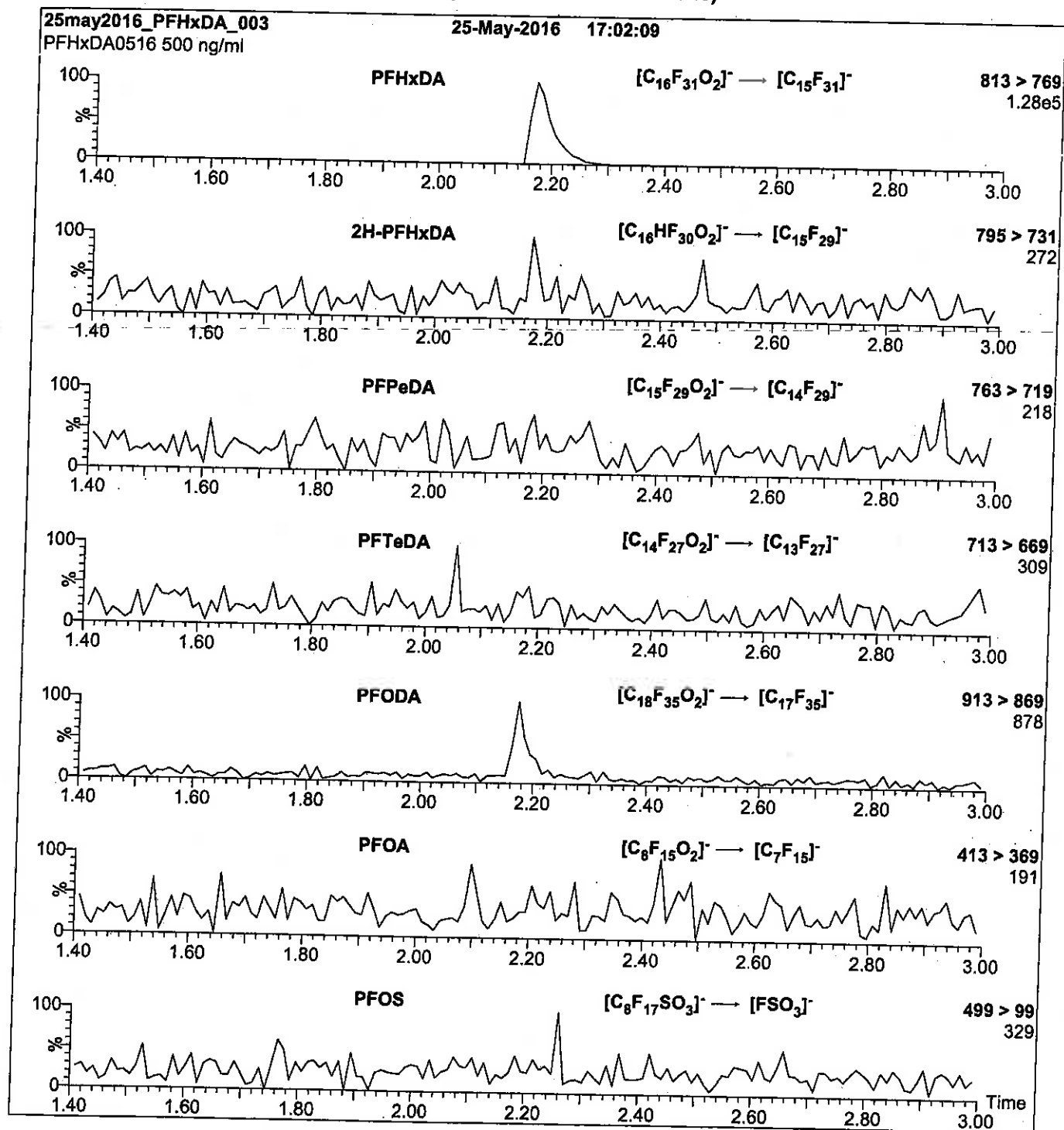
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (250 - 1250 amu)

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 3.00  
**Cone Voltage (V)** = 25.00  
**Cone Gas Flow (l/hr)** = 60  
**Desolvation Gas Flow (l/hr)** = 750

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



**Conditions for Figure 2:**

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

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) = 3.66e-3  
Collision Energy (eV) = 15

Reagent

---

**LCPFHxS-br\_00002**

SBC  
R: 9/13/16



730513  
ID: LCPFHxS-br\_00002  
Exp: 07/03/20 Pripd: SBC  
Potassium Perfluorohexane



730514  
ID: LCPFHxS-br\_00003  
Exp: 07/03/20 Pripd: SBC  
Potassium Perfluorohexane



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**br-PFHxSK**

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

**PRODUCT CODE:** br-PFHxSK  
**LOT NUMBER:** brPFHxSK0615  
**CONCENTRATION:** 50.0 ± 2.5 µg/ml (total potassium salt)  
45.5 ± 2.3 µg/ml (total PFHxS anion)  
**SOLVENT(S):** Methanol  
**DATE PREPARED:** (mm/dd/yyyy) 06/29/2015  
**LAST TESTED:** (mm/dd/yyyy) 07/03/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 07/03/2020  
**RECOMMENDED STORAGE:** 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  
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:**

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)\*\*

**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**    | $\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$           | 2.9                                        |
| 3      | Potassium 2-trifluoromethylperfluoropentanesulfonate      | $\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$           | 1.4                                        |
| 4      | Potassium 3-trifluoromethylperfluoropentanesulfonate      | $\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$           | 5.0                                        |
| 5      | Potassium 4-trifluoromethylperfluoropentanesulfonate      | $\begin{array}{c} \text{CF}_3\text{CF}_2\text{CF}_2\text{CF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$           | 8.9                                        |
| 6      | Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate | $\begin{array}{c} \text{CF}_3 \\   \\ \text{CF}_3\text{CCF}_2\text{CF}_2\text{SO}_3^-\text{K}^+ \\   \\ \text{CF}_3 \end{array}$            | 0.2                                        |
| 7      | Other Unidentified Isomers                                |                                                                                                                                             | 0.5                                        |

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

Certified By:

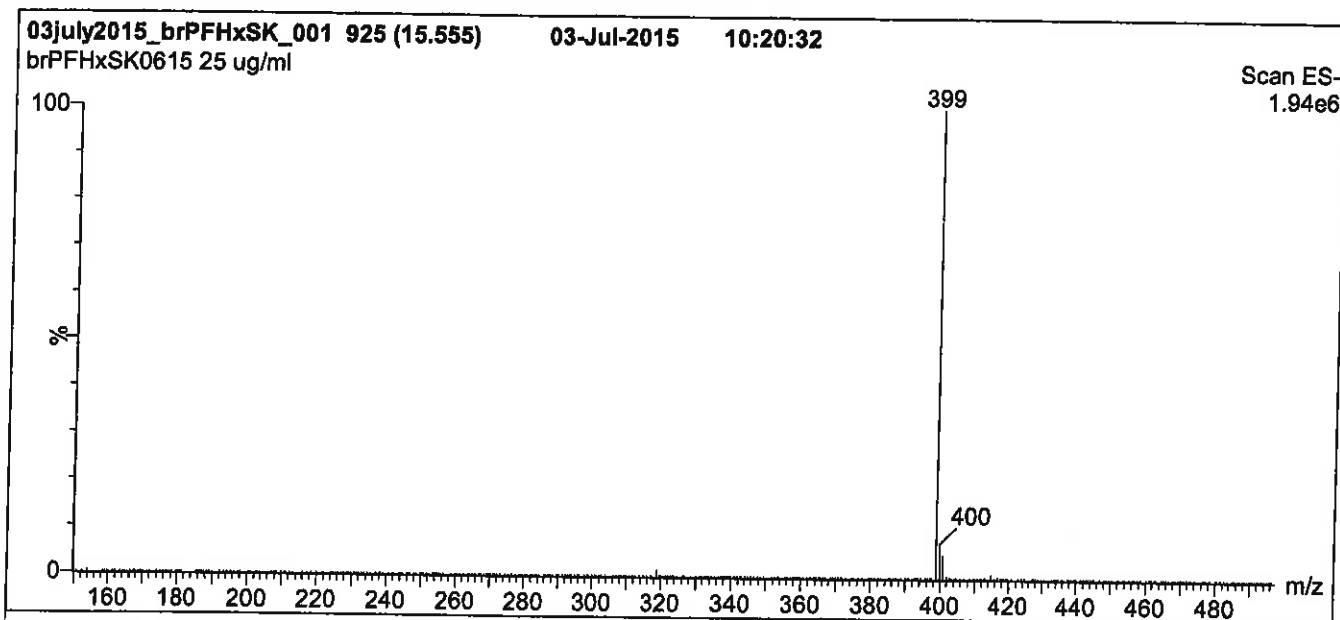
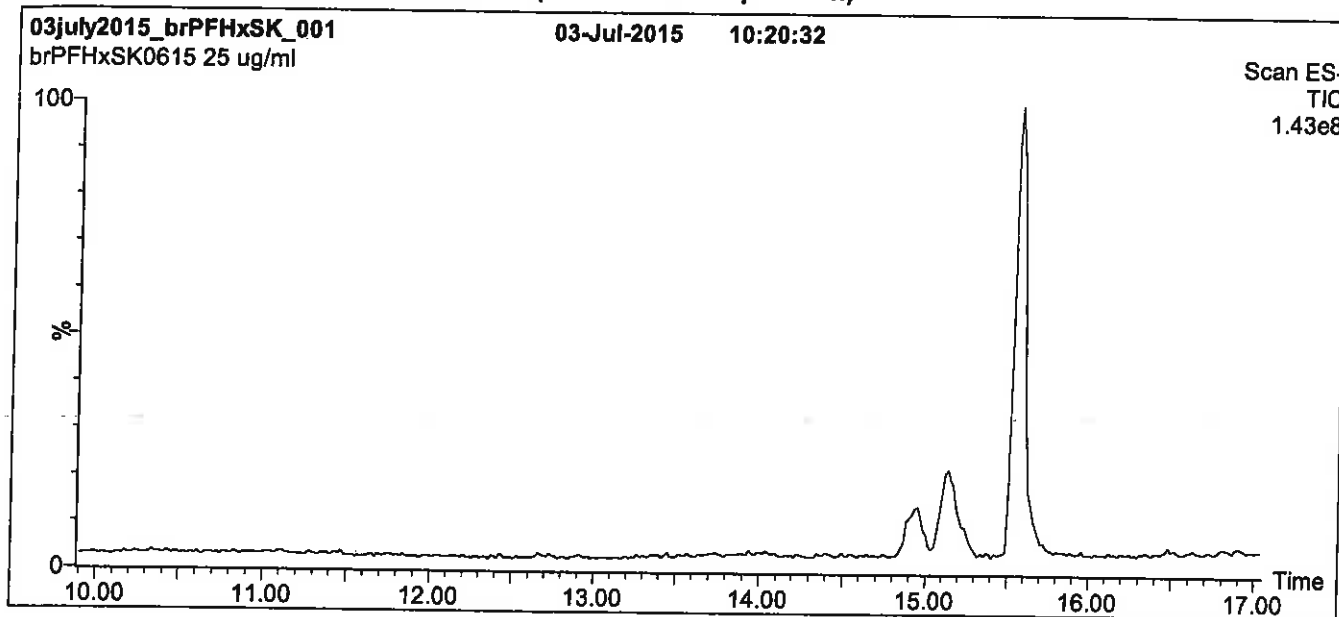
  
B.G. Chittim

Date: 07/15/2015

(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

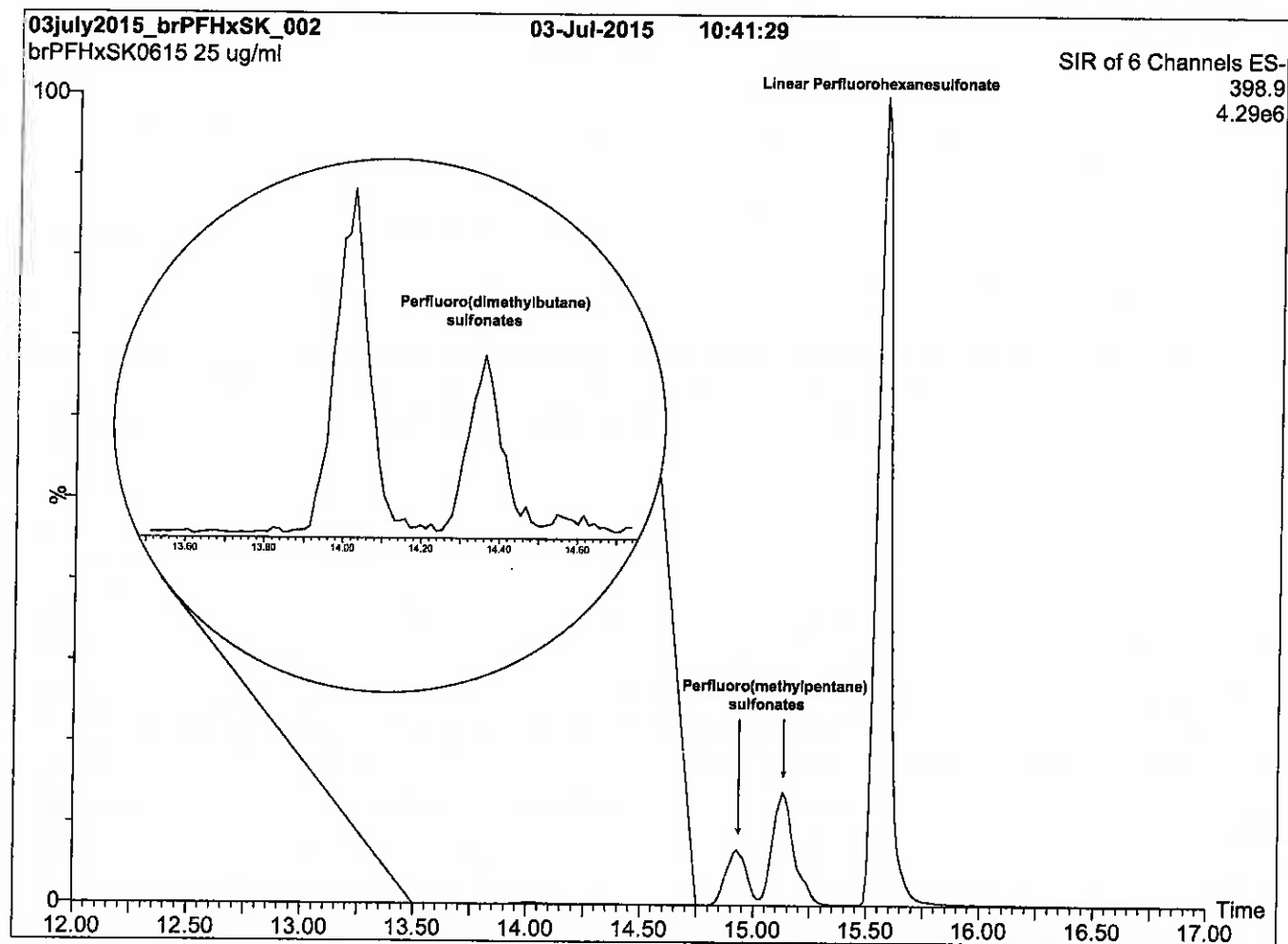
**Flow:** 300  $\mu$ l/min

**MS Parameters**

**Experiment:** Full Scan (150 - 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



**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

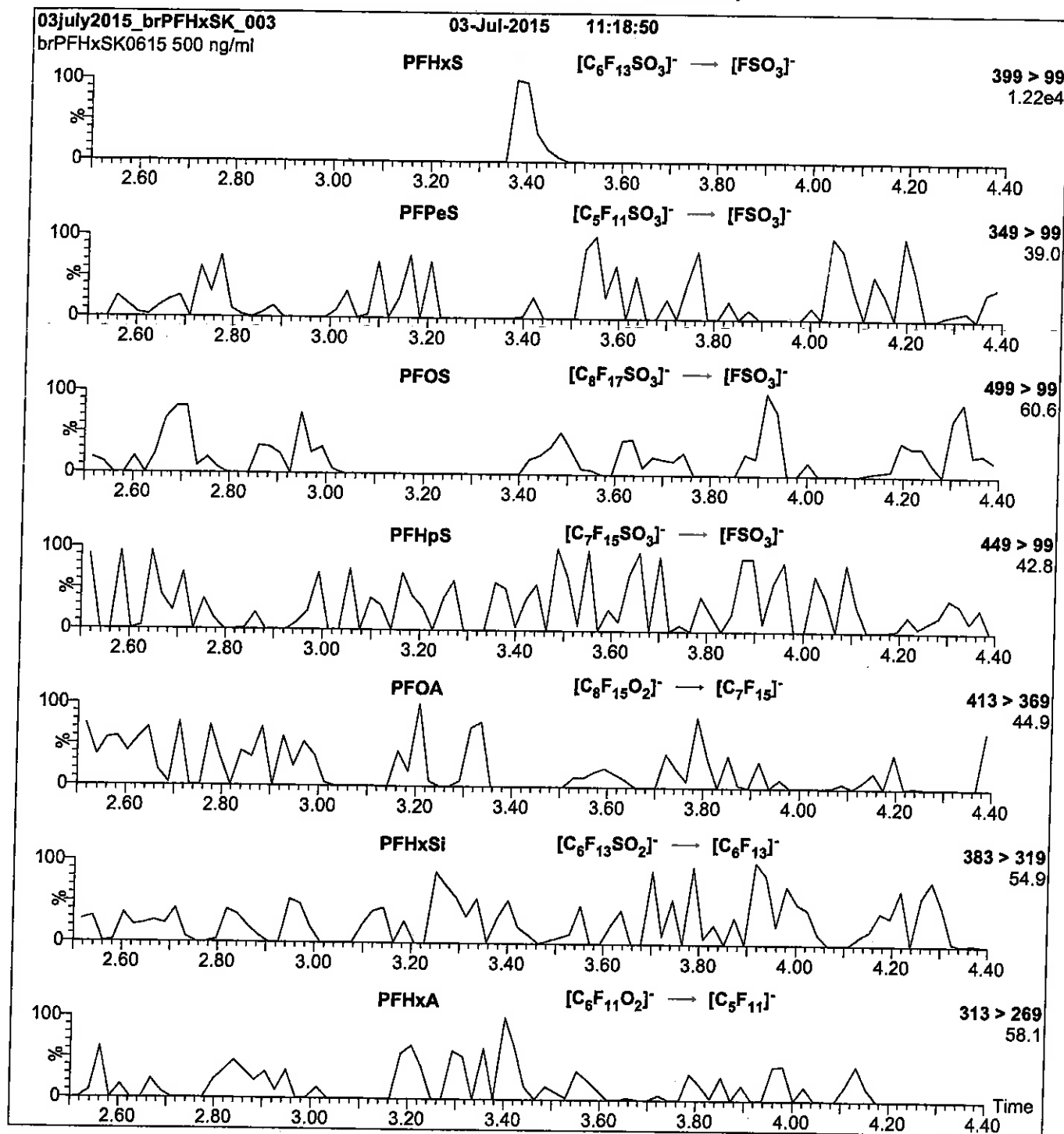
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: SIR (6 channels)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 50.00  
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%  $H_2O$   
(both with 10 mM  $NH_4OAc$  buffer)

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.54e-3  
Collision Energy (eV) = 30

Reagent

---

**LCPFNA\_00006**



WELLINGTON  
LABORATORIES



730559  
ID: LCPFNA\_00006  
Exp: 10/23/20 Pp4: SBC  
PF-n-nonanoic acid



730560  
ID: LCPFNA\_00007  
Exp: 10/23/20 Pp4: SBC  
PF-n-nonanoic acid

CERTIFICATE OF ANALYSIS  
DOCUMENTATION

**PRODUCT CODE:**

PFNA

**LOT NUMBER:**

PFNA1015

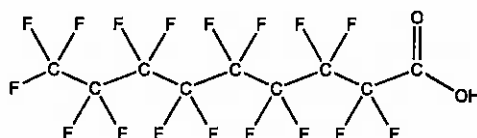
**COMPOUND:**

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)

10/23/2015

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

10/23/2020

**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) and < 0.1% of perfluoro-n-heptanoic acid (PFHpA).

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

Certified By:

B.G. Chittim

Date: 10/30/2015

(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.

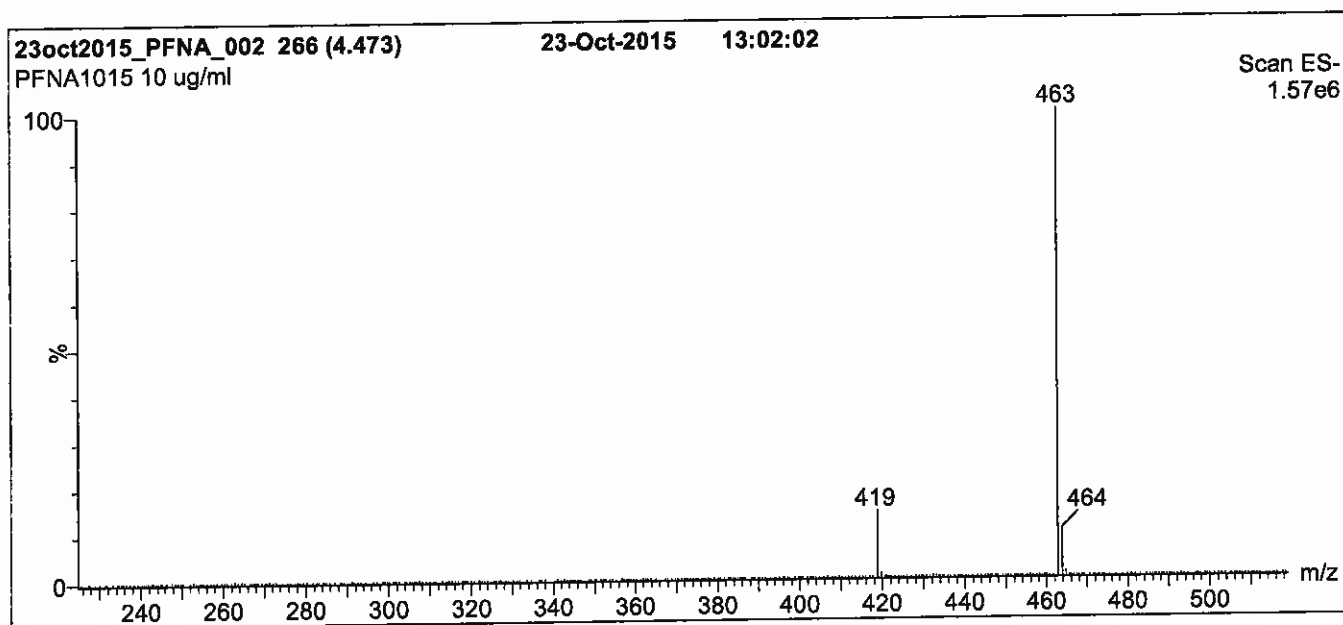
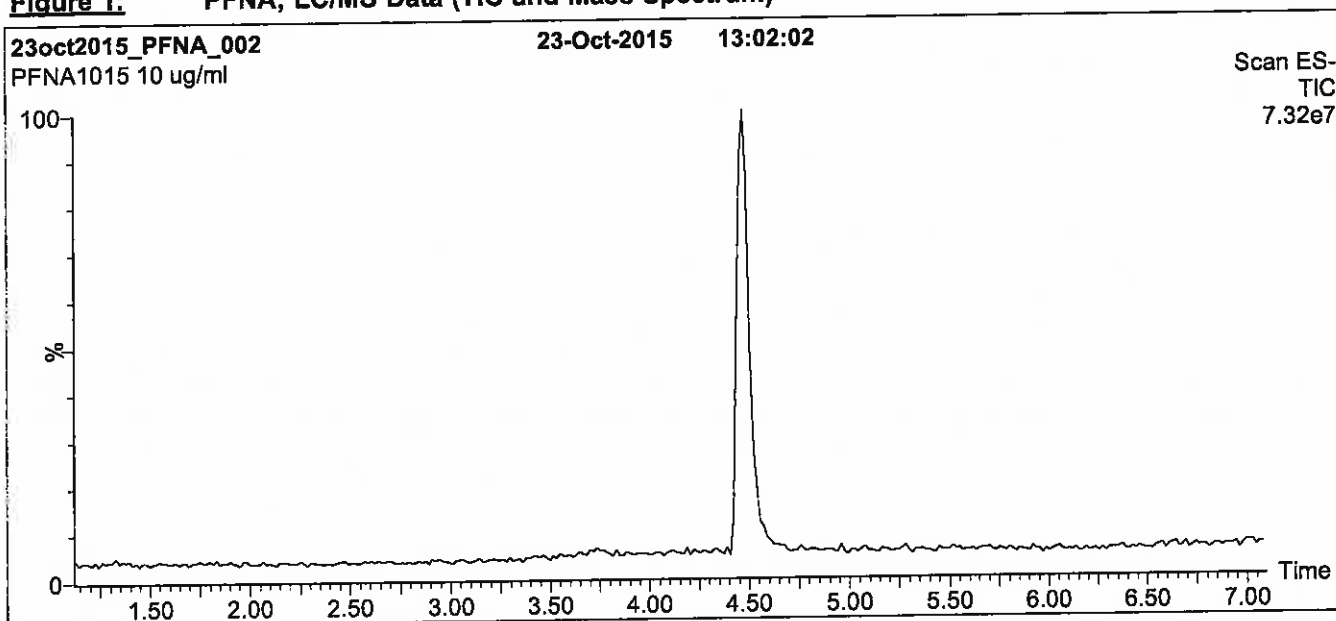
**QUALITY MANAGEMENT:**

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: 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)  
Ramp to 90% organic over 7 min and hold for 2 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

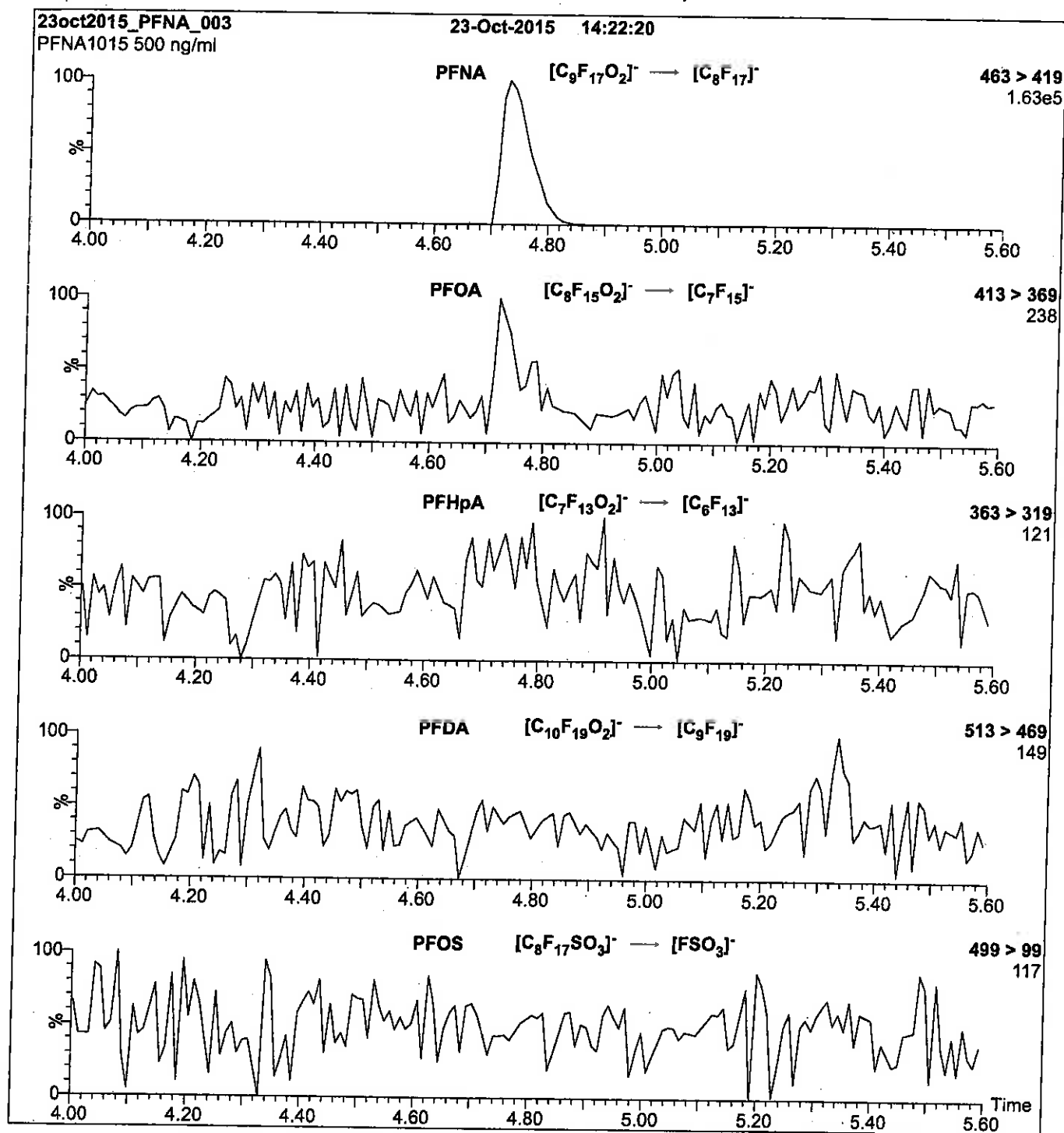
**Flow:** 300  $\mu$ l/min

**MS Parameters**

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

**Source:** Electrospray (negative)  
**Capillary Voltage (kV)** = 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) = 3.28e-3  
Collision Energy (eV) = 11



Reagent

---

**LCPFOA\_00006**

R-716/16CBW

671577  
 ID: LCPFOA\_00006  
 Exp: 11/06/20 Prod: CBW  
 PF-n-octanoic acid



# WELLINGTON LABORATORIES

## CERTIFICATE OF ANALYSIS DOCUMENTATION

**PRODUCT CODE:**

PFOA

**LOT NUMBER:**

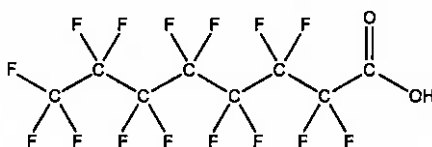
PFOA1115

**COMPOUND:**

Perfluoro-n-octanoic acid

**STRUCTURE:****CAS #:**

335-67-1

**MOLECULAR FORMULA:** $C_8H_2F_{15}O_2$ **MOLECULAR WEIGHT:**

414.07

**CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

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

11/06/2015

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

11/06/2020

**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: 11/11/2015

(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.

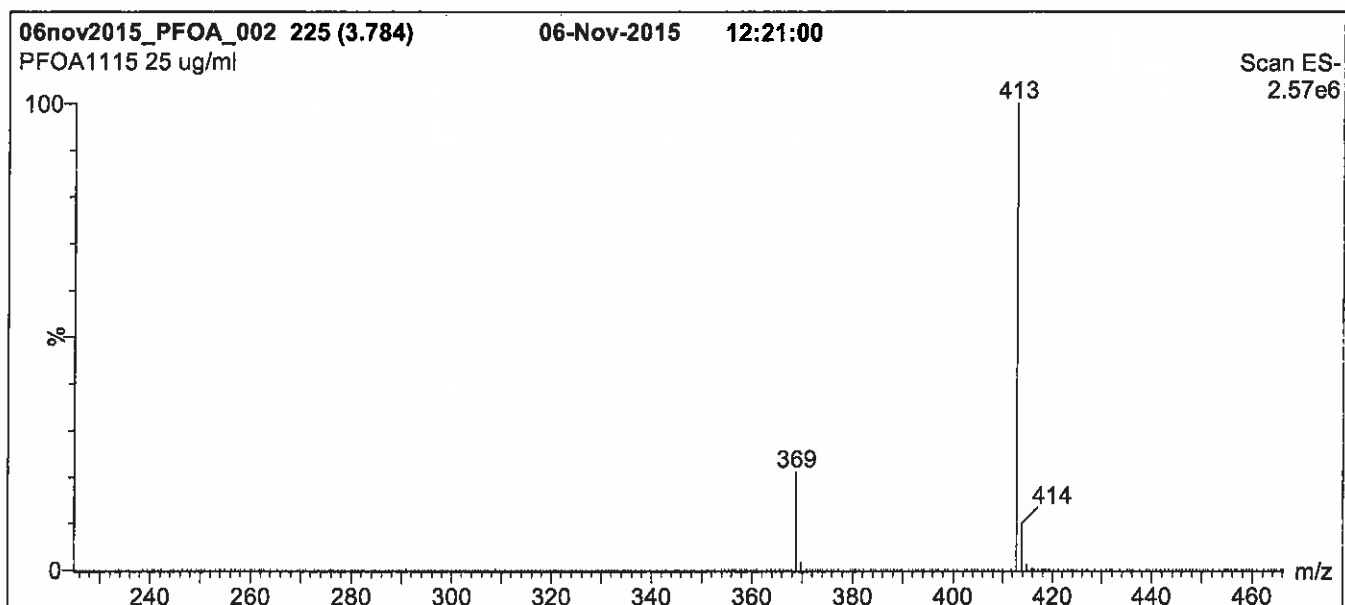
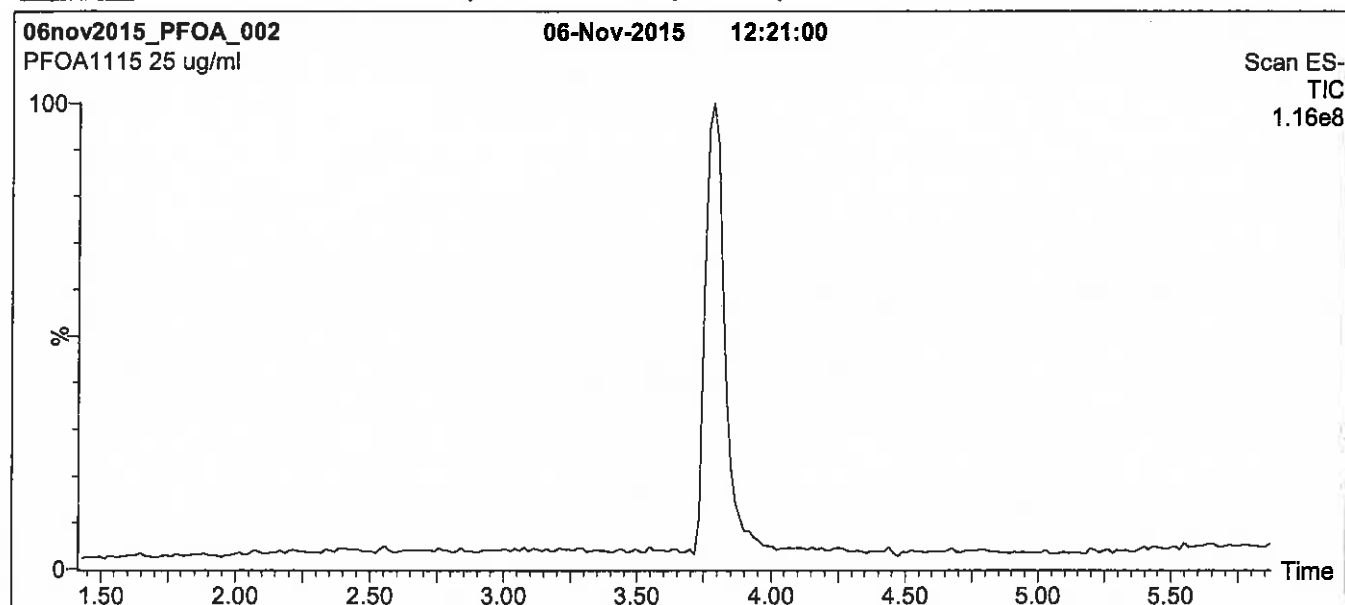
**QUALITY MANAGEMENT:**

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:** 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

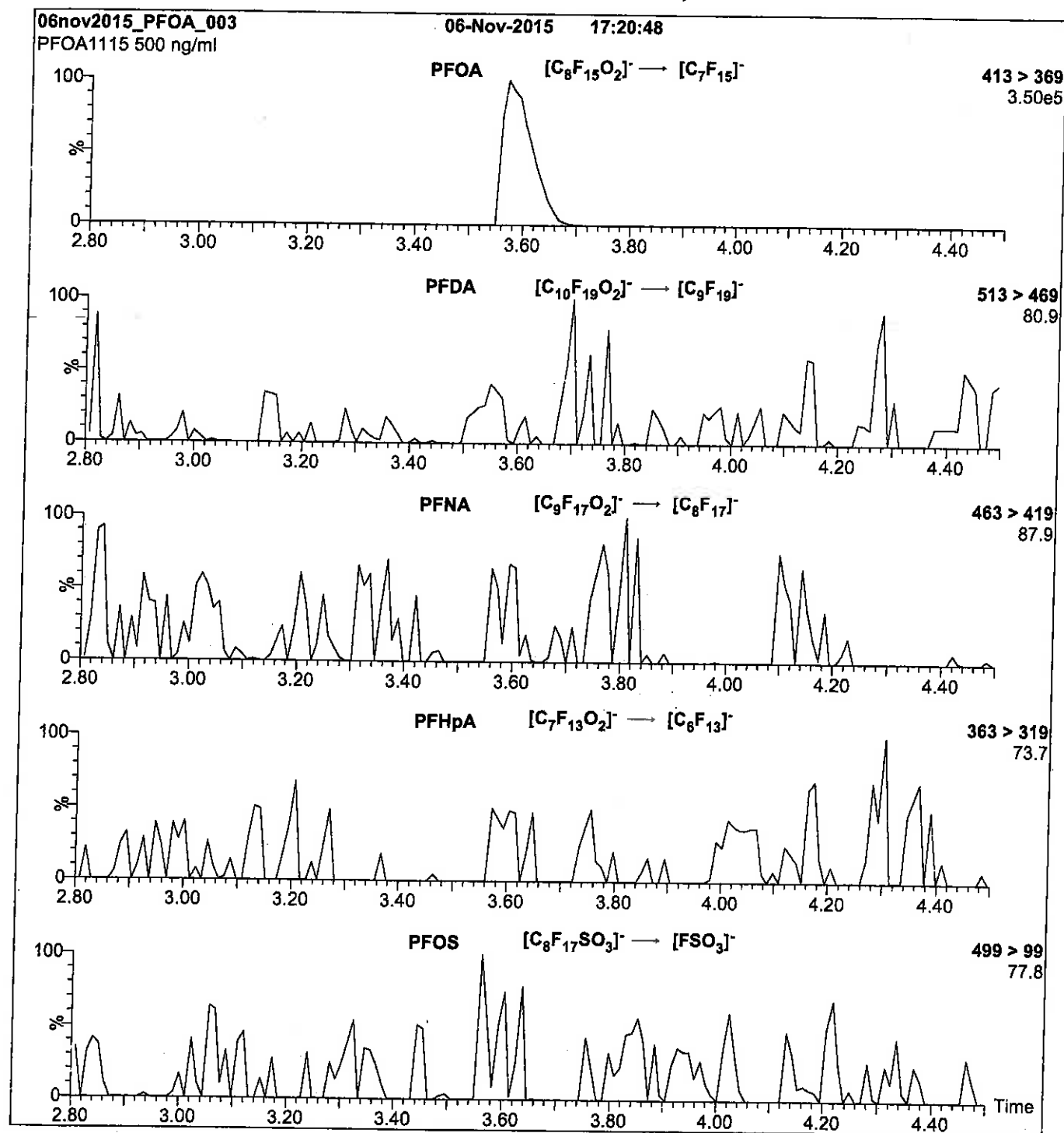
Flow: 300  $\mu$ l/min

**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) = 3.17e-3  
Collision Energy (eV) = 10

Reagent

---

**LCPFODA\_00006**



Scanned  
10/14/16  
P: SBC  
9/13/16

**WELLINGTON  
LABORATORIES**

730632  
ID: LCPFODA\_00006  
Exp: 04/29/21 Prod: SBC  
PFODA stock 50ug/mL

730633  
ID: LCPFODA\_00007  
Exp: 04/29/21 Prod: SBC  
PFODA stock 50ug/mL

**CERTIFICATE OF ANALYSIS  
DOCUMENTATION**

**PRODUCT CODE:**

PFODA

**LOT NUMBER:**

PFODA0416

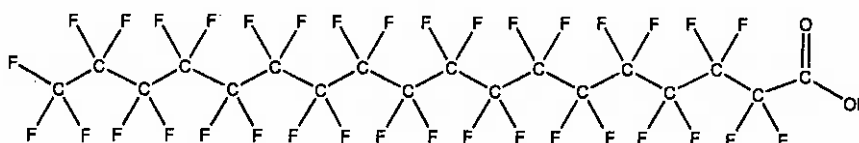
**COMPOUND:**

Perfluoro-n-octadecanoic acid

**STRUCTURE:**

**CAS #:**

16517-11-6



**MOLECULAR FORMULA:**

$C_{18}H_{36}O_2$

**MOLECULAR WEIGHT:**

914.14

**CONCENTRATION:**

50 ± 2.5 µg/mL

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

04/29/2016

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

04/29/2021

**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: 05/20/2016

(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:**

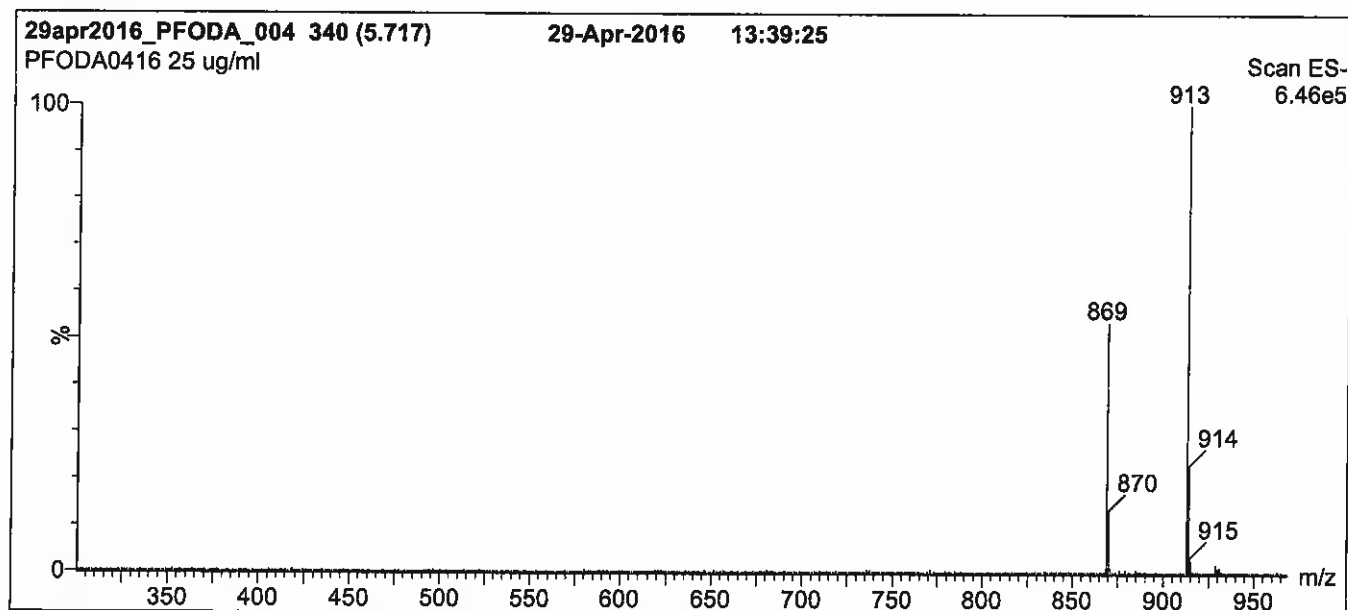
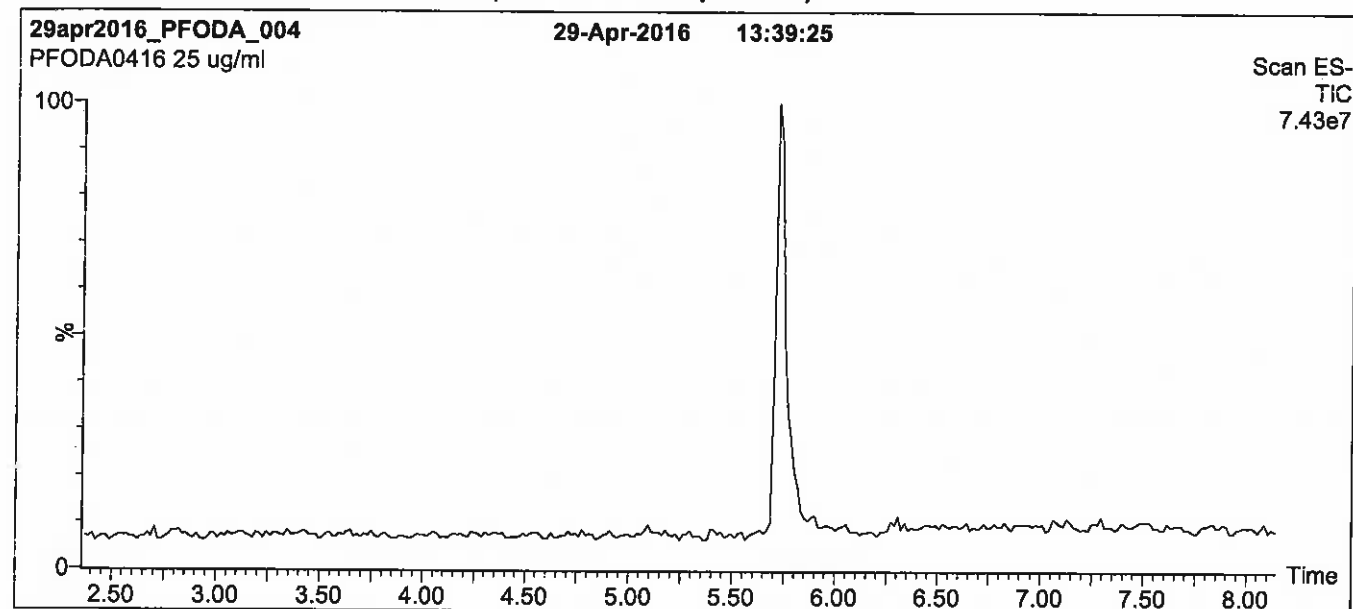
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



**\*\*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: PFODA; 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: 70% (80:20 MeOH:ACN) / 30% H<sub>2</sub>O  
(both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 95% organic over 6 min and hold for  
2.5 min before returning to initial conditions in 0.5 min.  
Time: 10 min

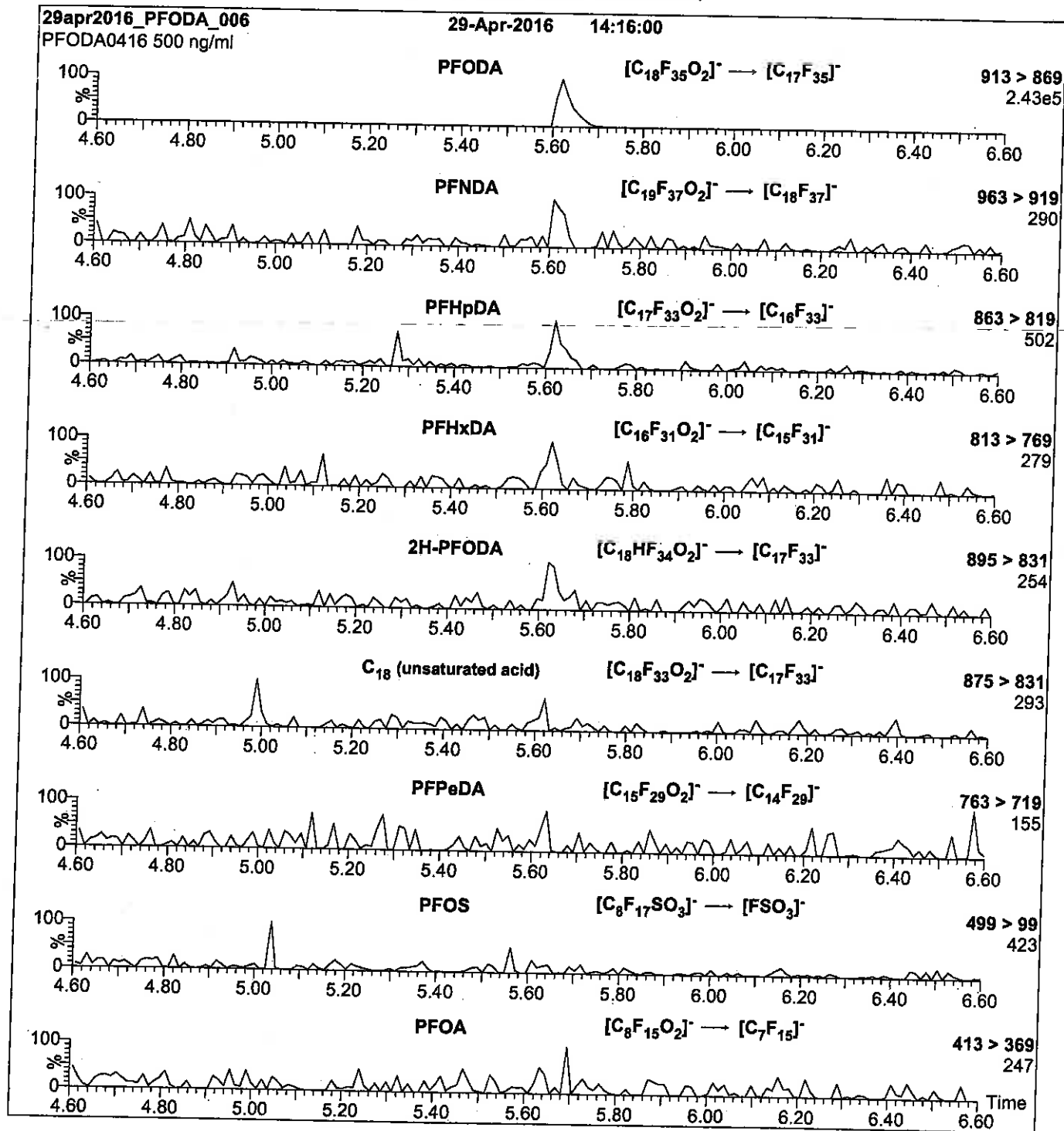
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (250 - 1000 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 25.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

Mobile phase: Isocratic 90% (80:20 MeOH:ACN) / 10% 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) = 3.39e-3  
Collision Energy (eV) = 15

Reagent

---

**LCPFOS-br\_00002**

Scanned  
10/14/16 SR

R: SBC 9/13/16



730515

ID: LCPFOS-br\_00002

Exp: 10/14/20 Ppdt: SBC

Potassium Perfluorooctane



730516

ID: LCPFOS-br\_00003

Exp: 10/14/20 Ppdt: SBC

Potassium Perfluorooctane



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**br-PFOSK**

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

**PRODUCT CODE:** br-PFOSK  
**LOT NUMBER:** brPFOSK1015  
**CONCENTRATION:** 50 ± 2.5 µg/ml (total potassium salt)  
46.4 ± 2.3 µg/ml (total PFOS anion)  
**SOLVENT(S):** Methanol  
**DATE PREPARED:** (mm/dd/yyyy) 10/13/2015  
**LAST TESTED:** (mm/dd/yyyy) 10/14/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 10/14/2020  
**RECOMMENDED STORAGE:** 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**  
**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:**

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)\*\*

**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> CF <sub>2</sub> SO <sub>3</sub> 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(SO <sub>3</sub> K <sup>+</sup> )CF <sub>3</sub>             | 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> 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> 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> 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> 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> K <sup>+</sup>                             | 10.0                                       |
| 8      | Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate | CF <sub>3</sub> 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> 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(CF <sub>3</sub> )CF <sub>2</sub> SO <sub>3</sub> 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> 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> K <sup>+</sup>                                         | 0.07                                       |

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

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

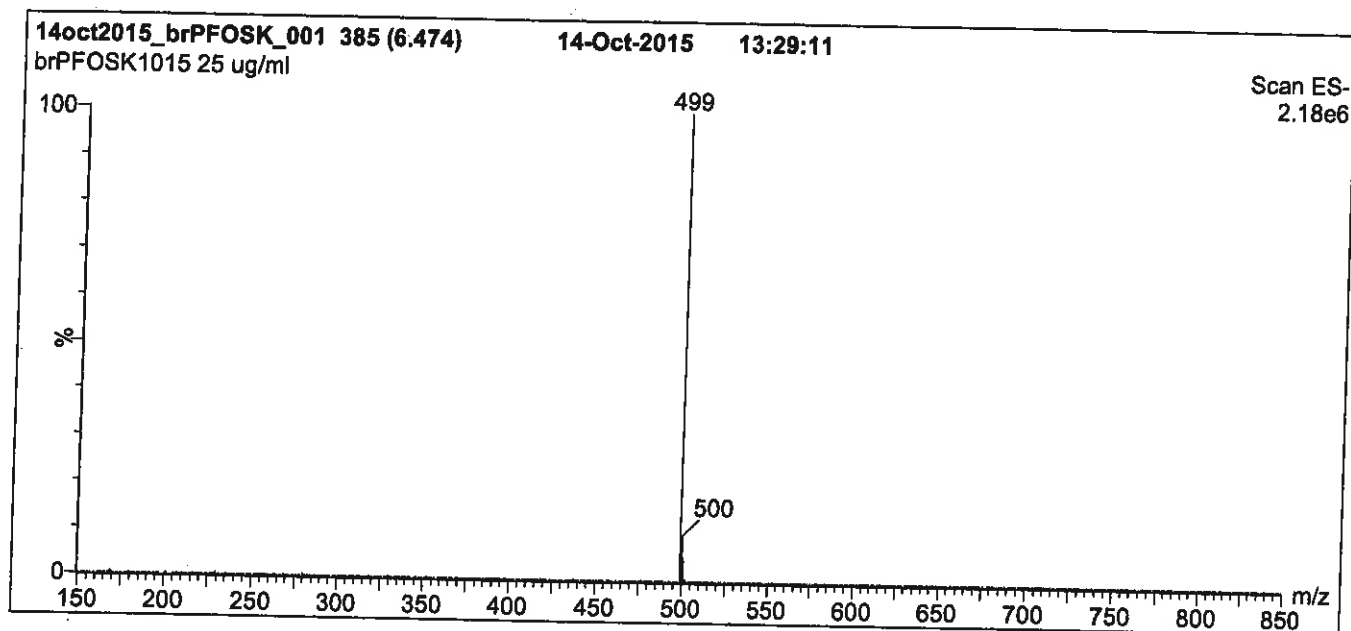
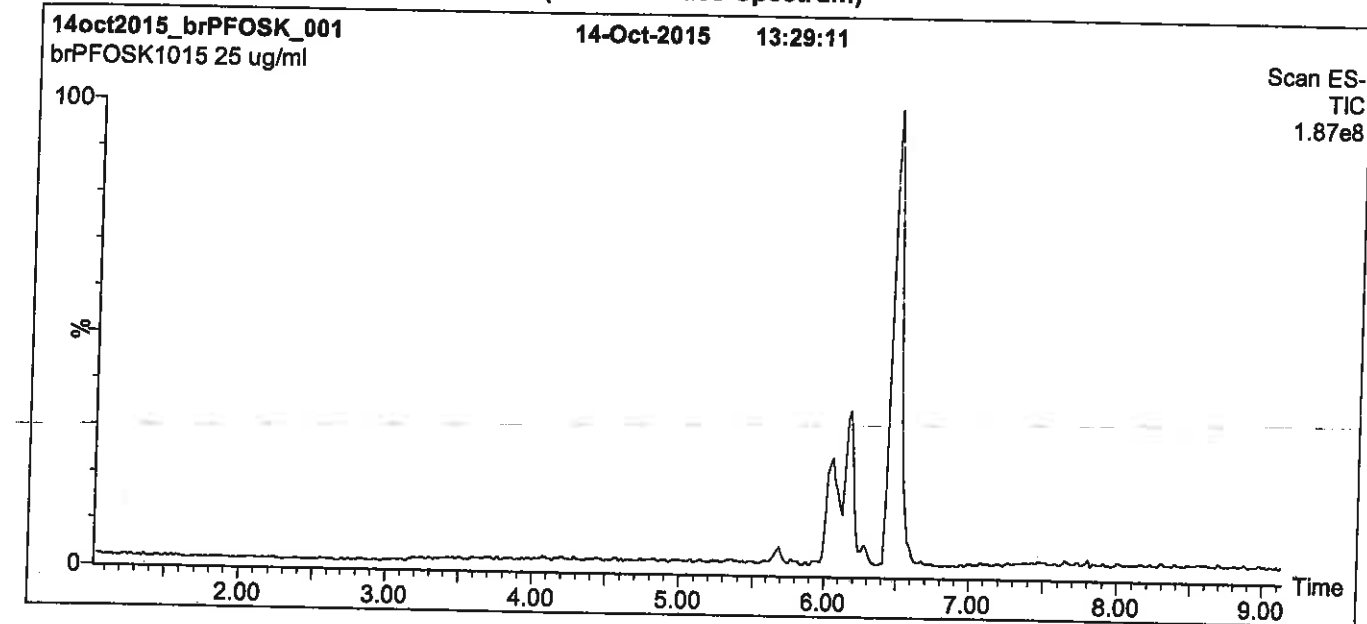
Certified By:

  
B.G. Chittim

Date: 10/15/2015

(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

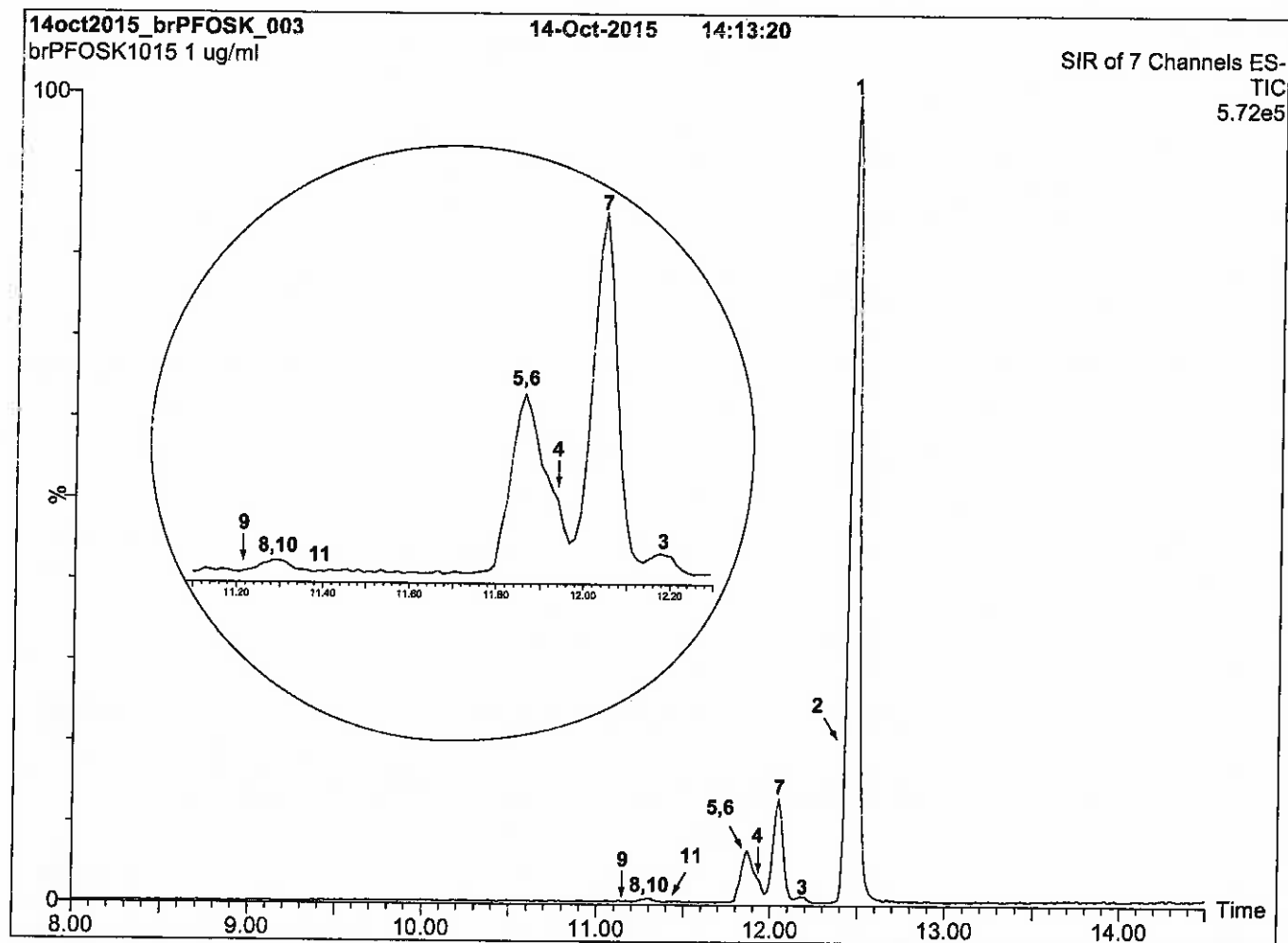
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
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:**

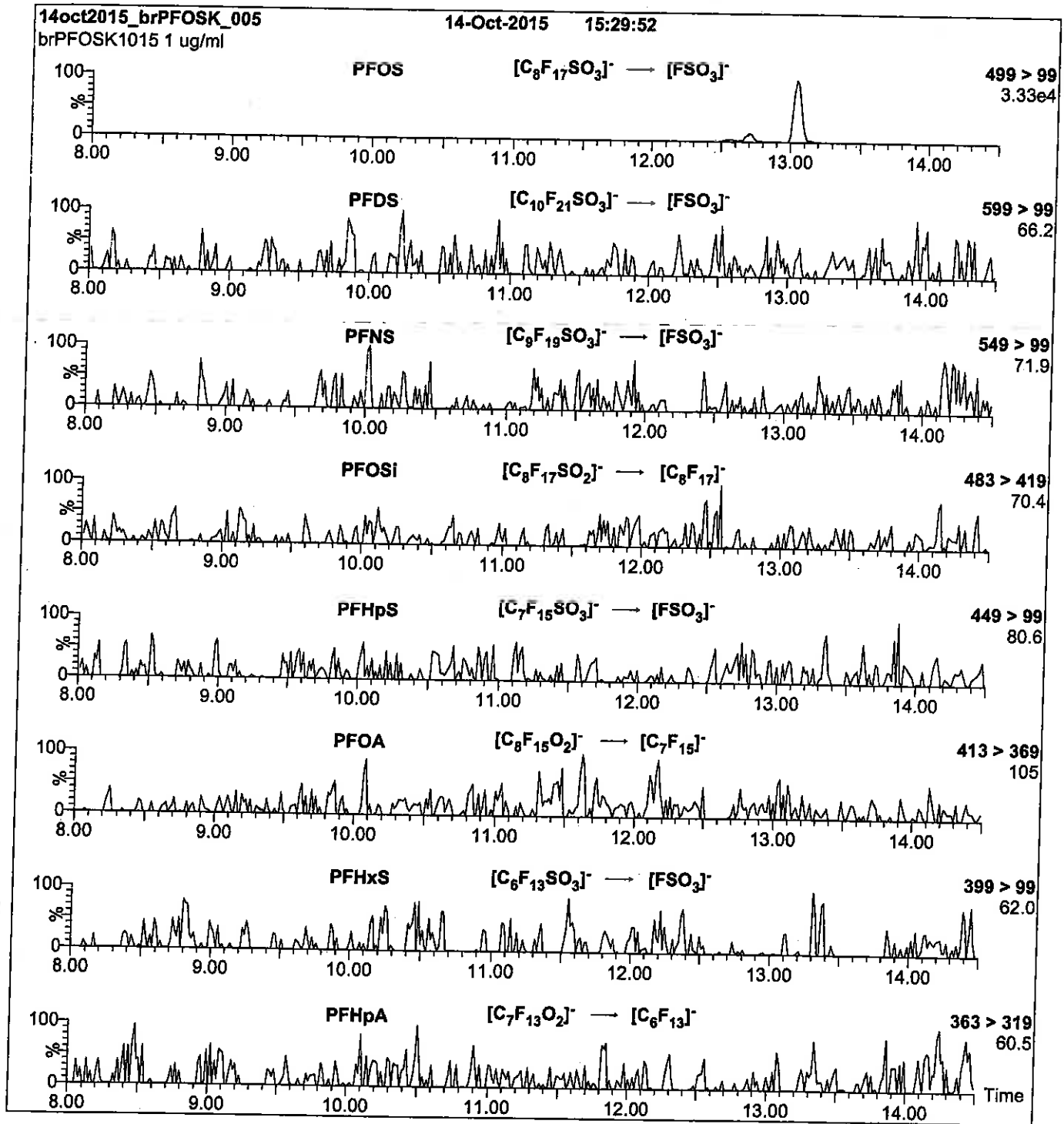
**Column:** Acquity UPLC BEH Shield RP<sub>18</sub> (1.7  $\mu$ m, 2.1 x 100 mm)  
**Injection:** 1.0  $\mu$ g/ml of br-PFOSK  
**Mobile Phase:** Gradient  
45% (80:20 MeOH:ACN) / 55% H<sub>2</sub>O (both with 10 mM NH<sub>4</sub>OAc buffer)  
Ramp to 90% organic over 15 min and hold for 3 min.  
Return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

**MS Parameters**

Collision Gas (mbar) = 3.06e-3

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

Reagent

---

**LCPFOSA\_00008**

Scanned  
10/14/16

R: SBC 9/13/16



730534  
ID: LCPFOSA\_00009  
Exp: 09/02/17 Prod: SBC  
PF-1-octanesulfonamide



730533  
ID: LCPFOSA\_00008  
Exp: 09/02/17 Prod: SBC  
PF-1-octanesulfonamide



**WELLINGTON**  
LABORATORIES

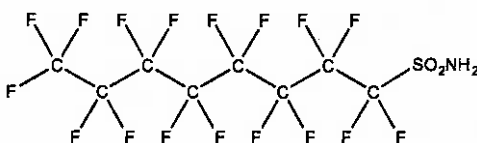
**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:** FOSA-I  
**COMPOUND:** Perfluoro-1-octanesulfonamide

**LOT NUMBER:** FOSA0815I

**STRUCTURE:**

**CAS #:** 754-91-6



**MOLECULAR FORMULA:**  $C_8H_2F_{17}NO_2S$   
**CONCENTRATION:**  $50 \pm 2.5 \mu g/ml$   
**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 09/02/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 09/02/2017  
**RECOMMENDED STORAGE:** Refrigerate ampoule

**MOLECULAR WEIGHT:** 499.14  
**SOLVENT(S):** Isopropanol

**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.

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

**Certified By:**

B.G. Chittim

**Date:** 09/11/2015

(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.

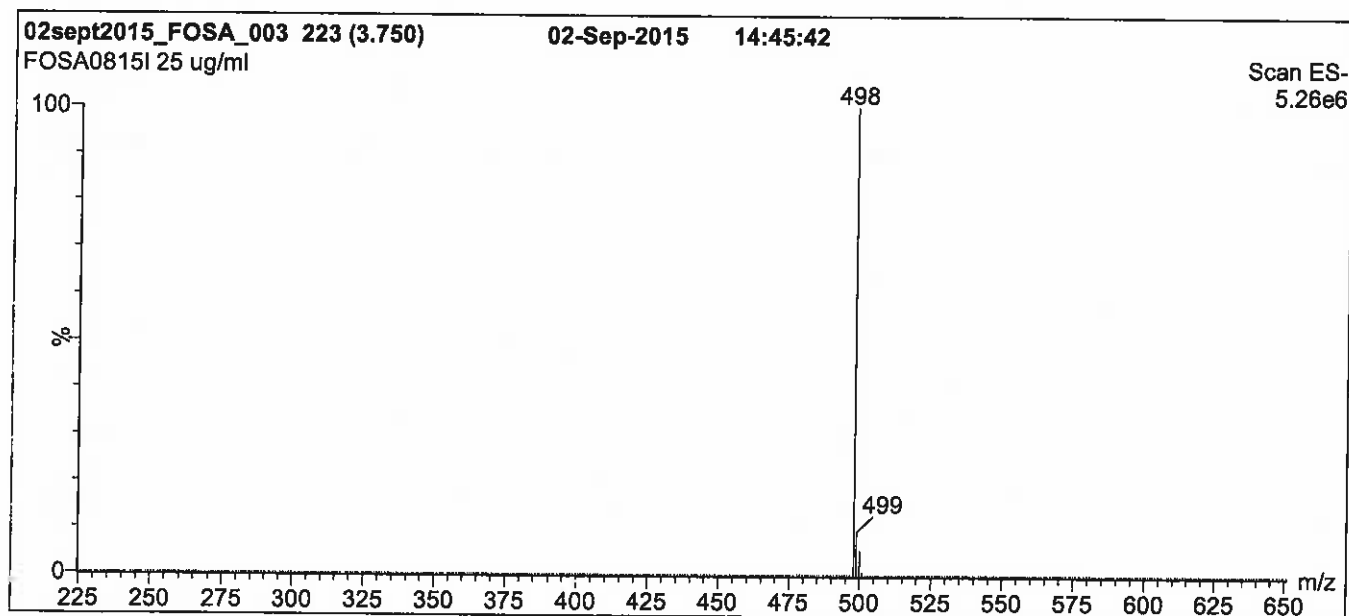
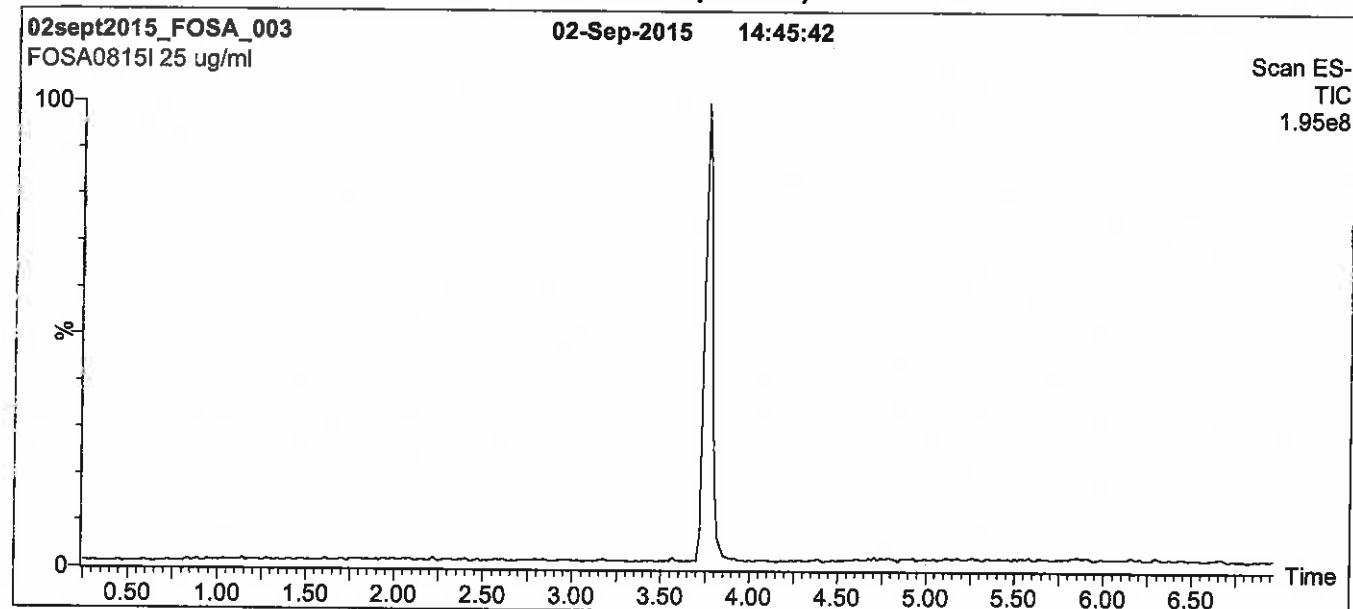
### **QUALITY MANAGEMENT:**

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: FOSA-I; 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: 60% (80:20 MeOH:ACN) / 40% 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

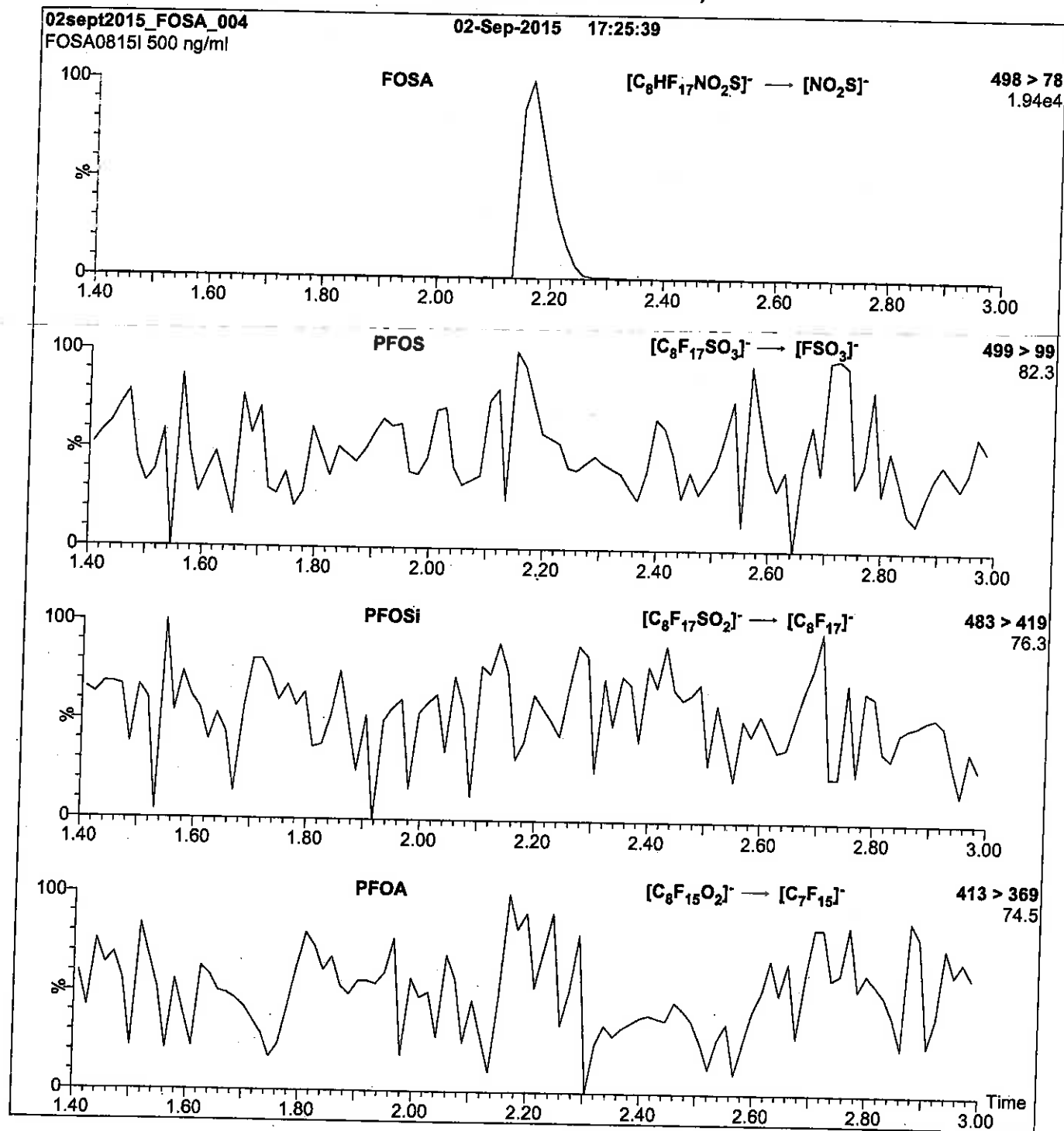
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.50  
Cone Voltage (V) = 40.00  
Cone Gas Flow (l/hr) = 50  
Desolvation Gas Flow (l/hr) = 750

**Figure 2: FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



**Conditions for Figure 2:**

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

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) = 3.54e-3  
Collision Energy (eV) = 30

Reagent

---

**LCPFPeA\_00005**

R: 7/6/16 CBW



671579

ID: LCPFPeA\_00005

Exp: 01/30/20 Prod: CBW

PF-n-pentanoic acid

**WELLINGTON**  
LABORATORIES**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION****PRODUCT CODE:**

PFPeA

**LOT NUMBER:**

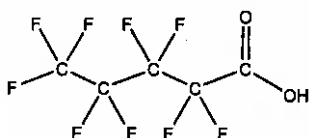
PFPeA0115

**COMPOUND:**

Perfluoro-n-pentanoic acid

**STRUCTURE:****CAS #:**

2706-90-3

**MOLECULAR FORMULA:** $C_5H_9F_9O_2$ **MOLECULAR WEIGHT:**

264.05

**CONCENTRATION:** $50 \pm 2.5 \mu\text{g/ml}$ **SOLVENT(S):**

Methanol

Water (&lt;1%)

**CHEMICAL PURITY:**

&gt;98%

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

01/30/2015

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

01/30/2020

**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 ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of  $C_5H_2F_8O_2$  (hydrido - derivative) as measured by  $^{19}\text{F}$  NMR.

**FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE****Certified By:**
  
B.G. Chittim
**Date:** 03/26/2015

(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.

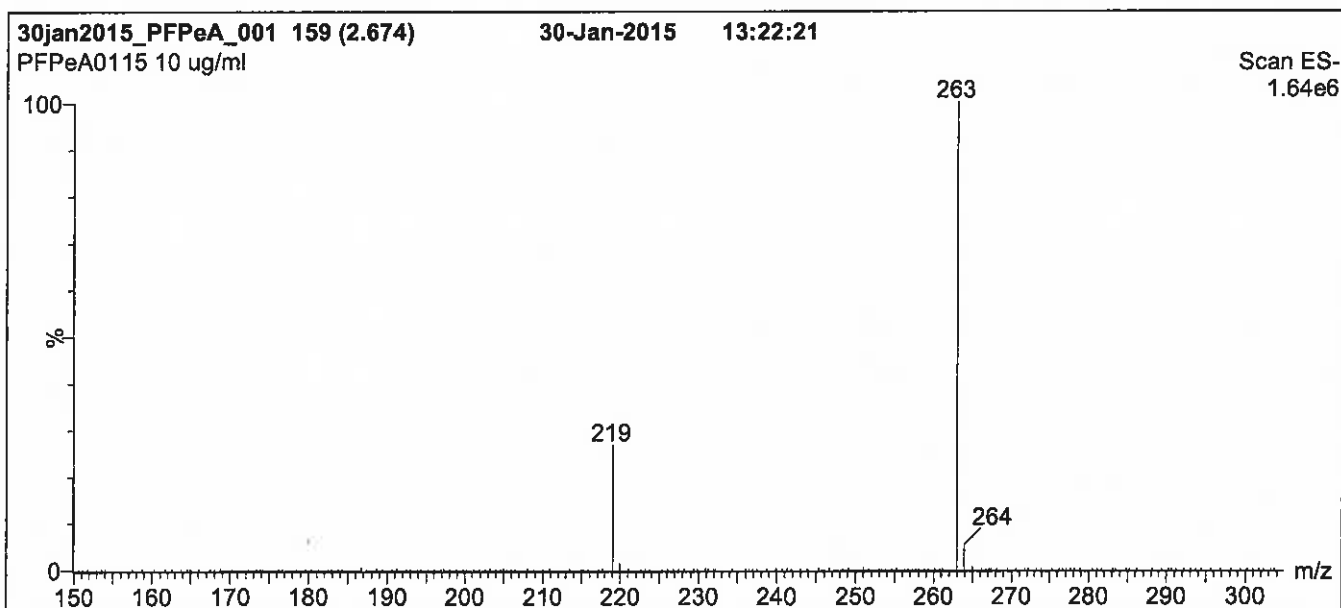
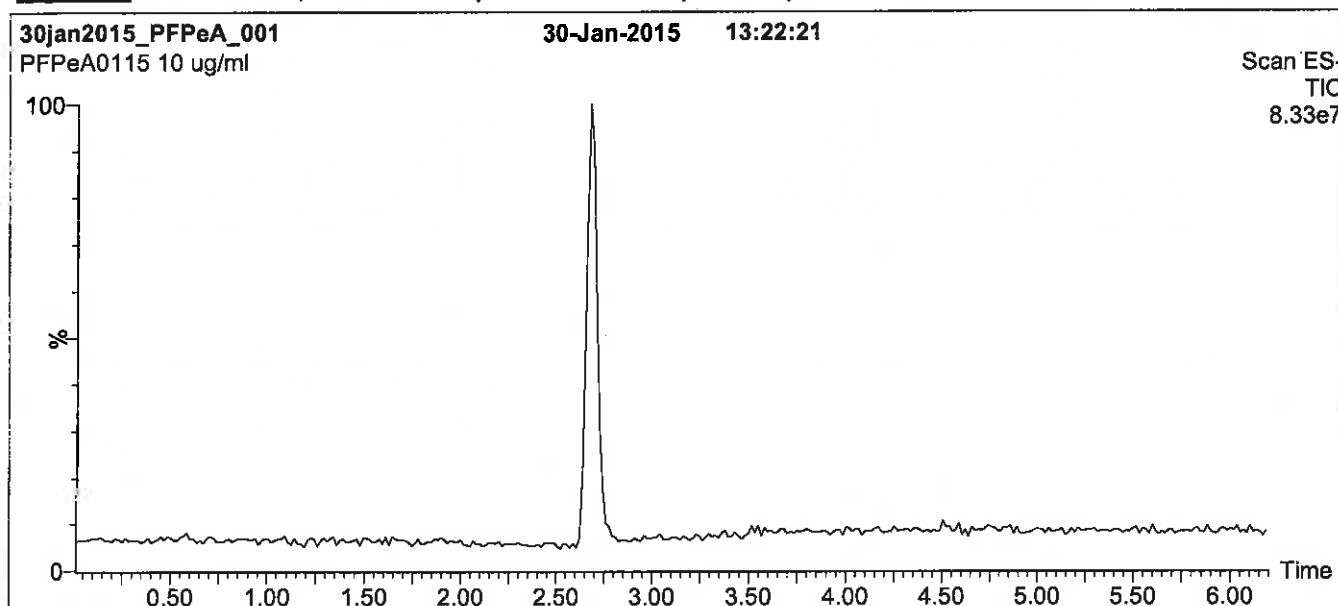
**QUALITY MANAGEMENT:**

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: PFPeA; 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: 30% (80:20 MeOH:ACN) / 70% 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 min  
before returning to initial conditions in 0.5 min.  
Time: 10 min

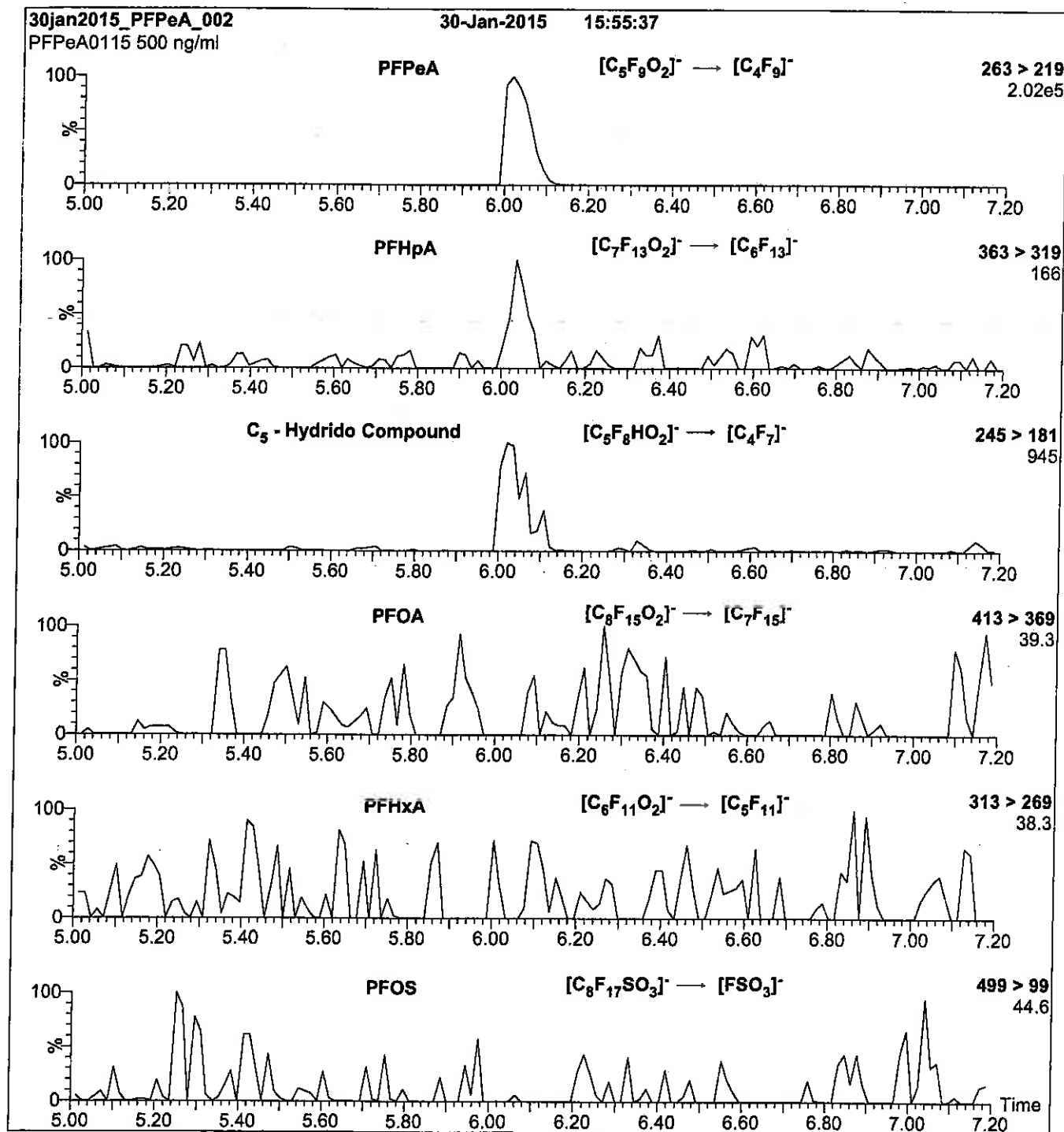
Flow: 300  $\mu$ l/min

**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) = 60  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 9

Reagent

---

**LCPFTeDA\_00005**

P: SBG 9/13/16



730645  
ID: LCPFTeDA\_00005  
Exp: 12/09/20 Prod: SBC  
PF-n-tetradecanoic acid



730659  
ID: LCPFTeDA\_00006  
Exp: 12/09/20 Prod: SBC  
PF-n-tetradecanoic acid



**WELLINGTON**  
LABORATORIES

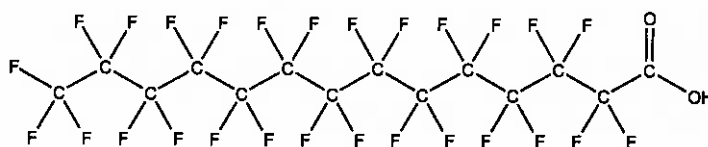
**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:** PFTeDA  
**COMPOUND:** Perfluoro-n-tetradecanoic acid

**LOT NUMBER:** PFTeDA1215

**STRUCTURE:**

**CAS #:** 376-06-7



**MOLECULAR FORMULA:**  $C_{14}HF_{27}O_2$   
**CONCENTRATION:**  $50 \pm 2.5 \mu\text{g/ml}$

**MOLECULAR WEIGHT:** 714.11  
**SOLVENT(S):** Methanol  
Water (<1%)

**CHEMICAL PURITY:** >98%  
**LAST TESTED:** (mm/dd/yyyy) 12/09/2015  
**EXPIRY DATE:** (mm/dd/yyyy) 12/09/2020  
**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 ~ 0.2% of PFDoA ( $C_{12}HF_{23}O_2$ ) and ~ 0.2% of PFPeDA ( $C_{16}HF_{29}O_2$ ).

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

**Certified By:**

B.G. Chittim

**Date:** 12/09/2015  
(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:**

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.

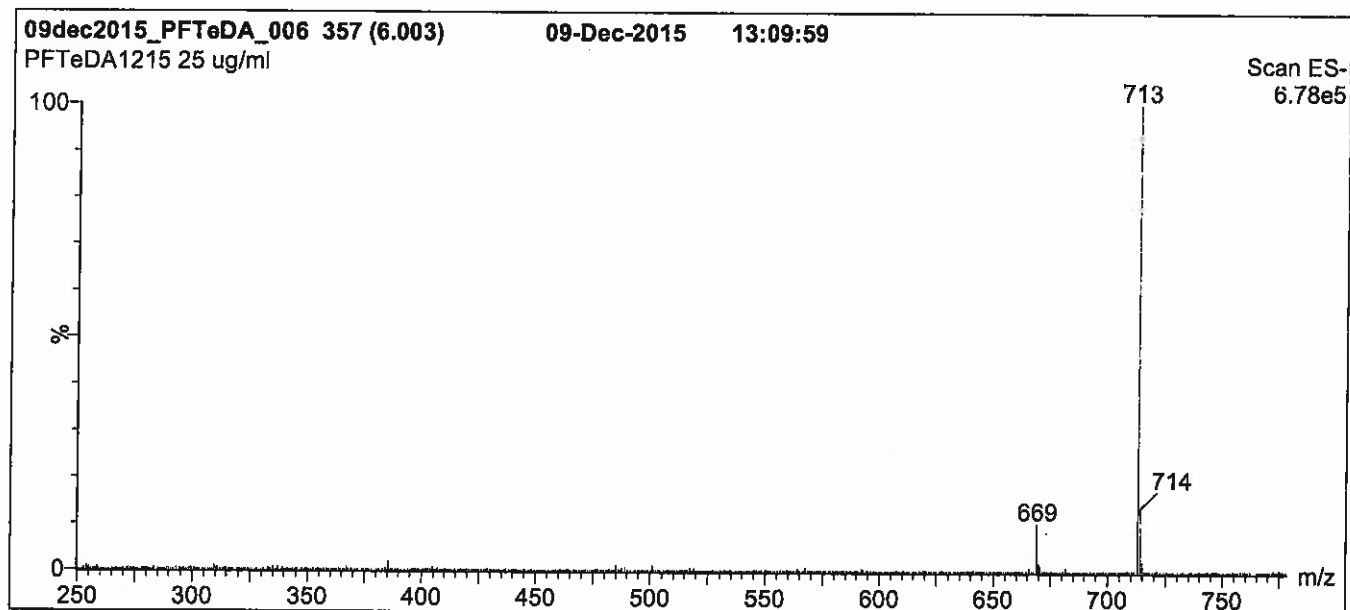
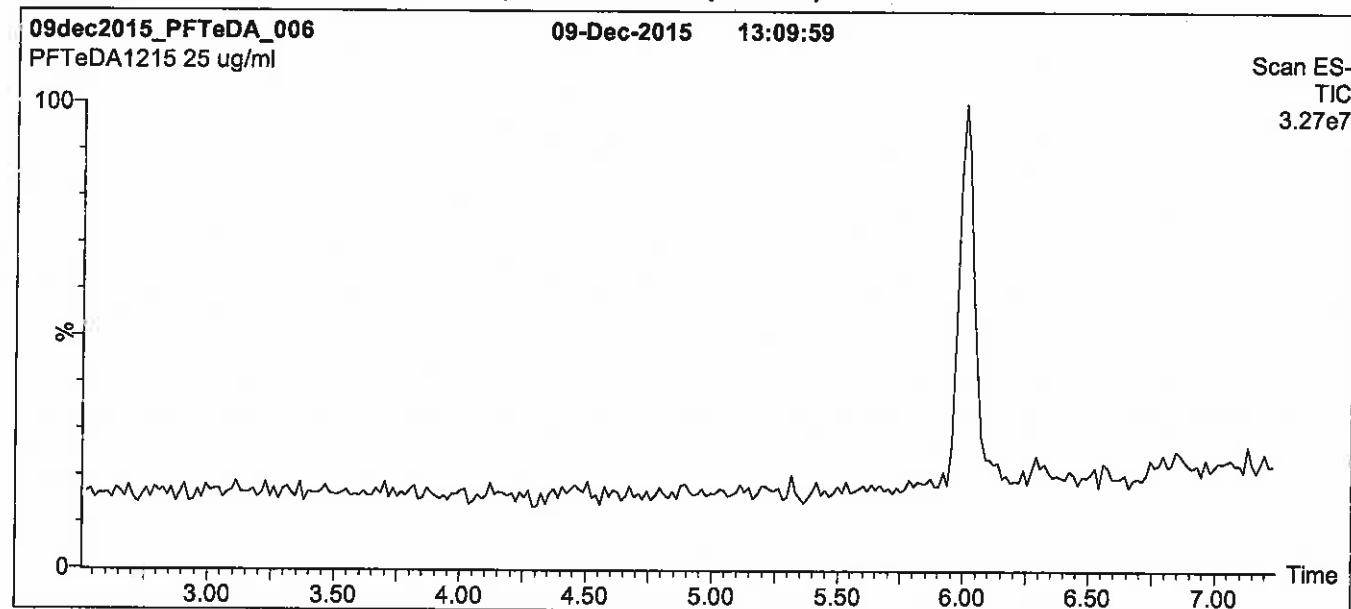
### **QUALITY MANAGEMENT:**

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: PFTeDA; 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: 65% (80:20 MeOH:ACN) / 35% 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

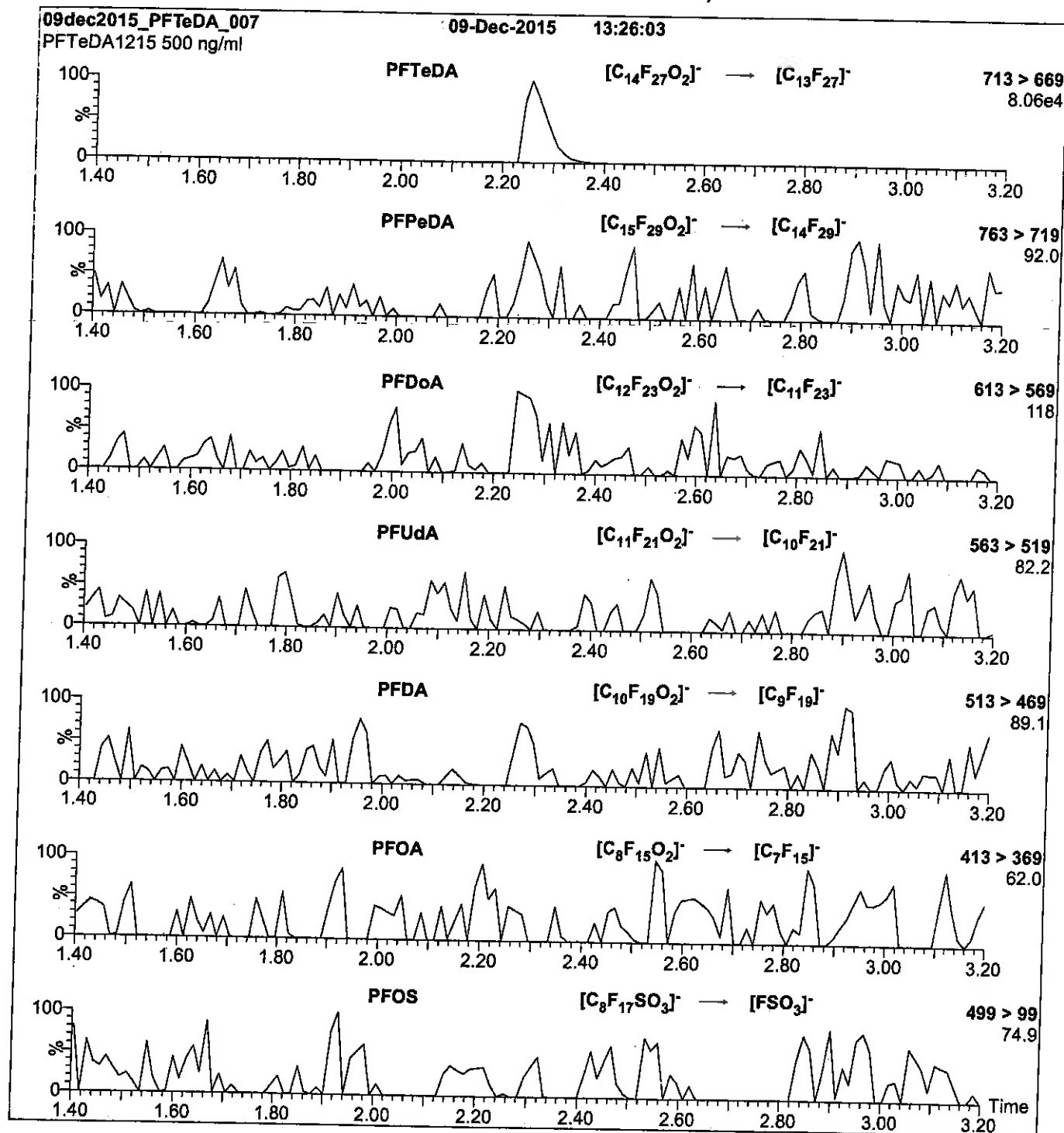
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.43e-3  
Collision Energy (eV) = 14



Reagent

---

**LCPFT<sub>r</sub>DA\_00005**

R: SBC 9/13/16



730665  
ID: LCPFTDA\_00005  
Exp: 02/12/21 Prod: SBC  
PF-n-tridecanoic acid



730666  
ID: LCPFTDA\_00006  
Exp: 02/12/21 Prod: SBC  
PF-n-tridecanoic acid



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:**

PFTTrDA

**LOT NUMBER:**

PFTTrDA0216

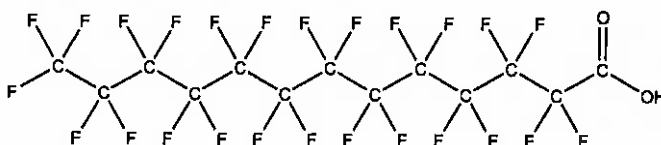
**COMPOUND:**

Perfluoro-n-tridecanoic acid

**STRUCTURE:**

**CAS #:**

72629-94-8



**MOLECULAR FORMULA:**

$C_{13}H_{25}O_2$

**MOLECULAR WEIGHT:**

664.11

**CONCENTRATION:**

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

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

02/12/2016

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

02/12/2021

**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 PFUDA ( $C_{11}H_{21}O_2$ ), ~ 0.4% of PFDa ( $C_{12}H_{23}O_2$ ), and ~ 0.1% of PFTeDA ( $C_{14}H_{27}O_2$ ).

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

Certified By:

B.G. Chittim

Date: 02/16/2016

(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.

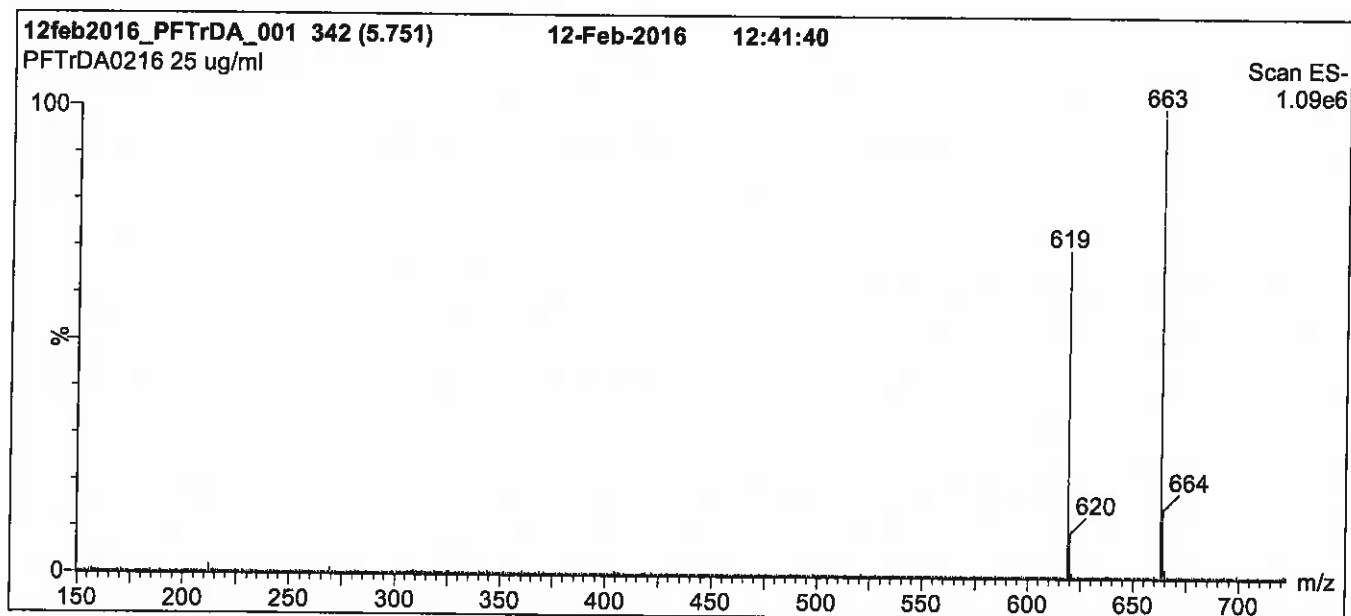
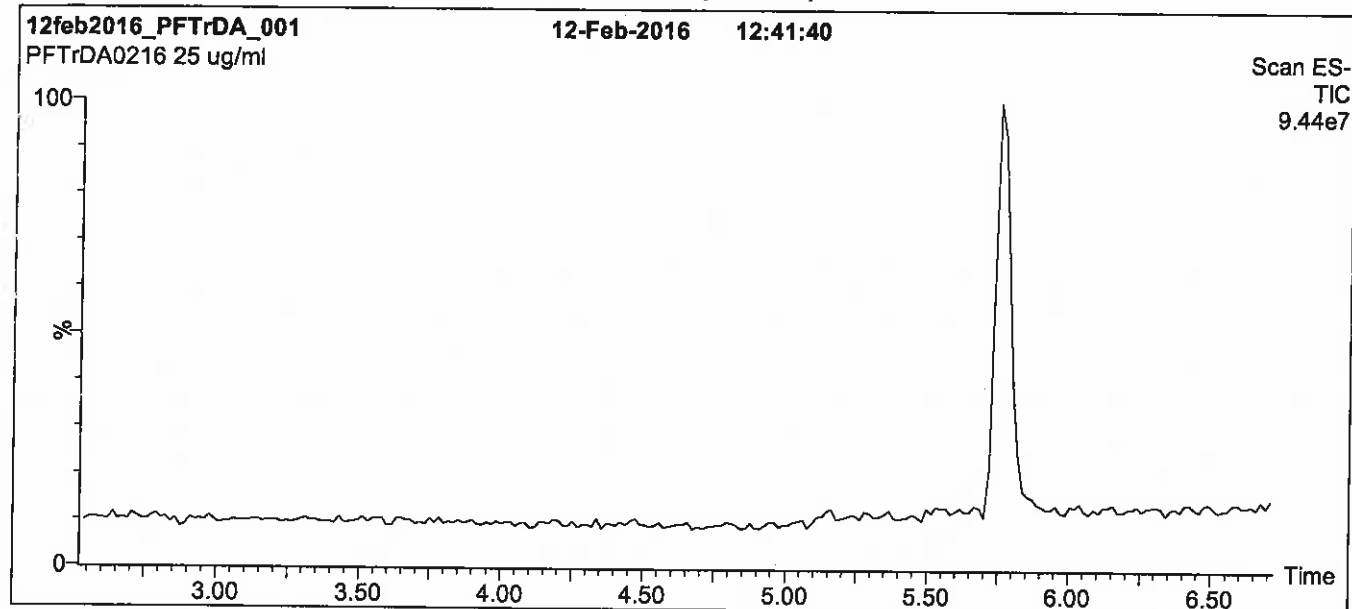
**QUALITY MANAGEMENT:**

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: PFTrDA; 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: 60% (80:20 MeOH:ACN) / 40% 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

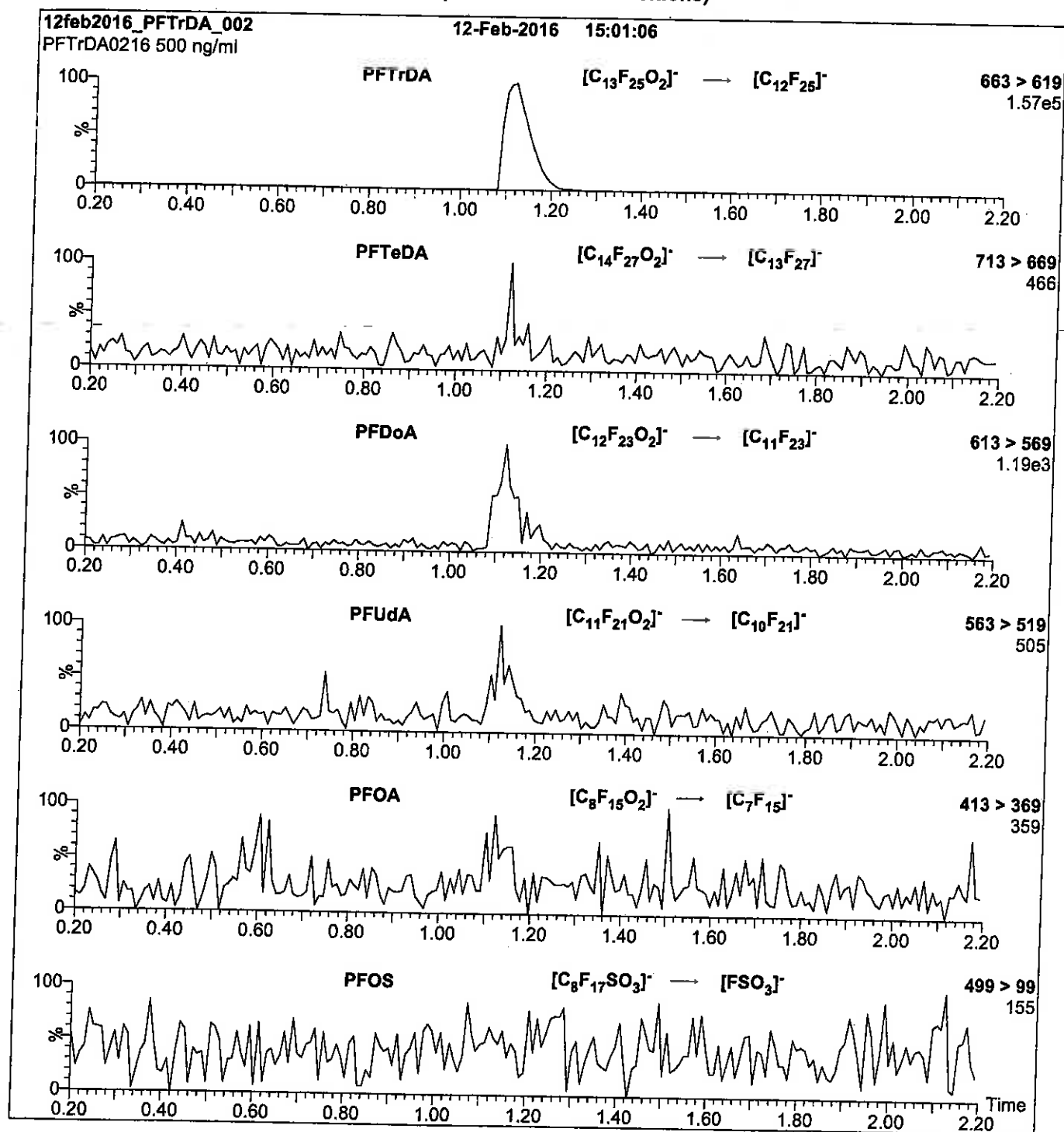
**Flow:** 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 2.00  
Cone Voltage (V) = 22.00  
Cone Gas Flow (l/hr) = 60  
Desolvation Gas Flow (l/hr) = 650

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



**Conditions for Figure 2:**

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

Mobile phase: Isocratic 80% MeOH / 20%  $H_2O$

Flow: 300  $\mu$ l/min

**MS Parameters**

Collision Gas (mbar) = 3.35e-3  
Collision Energy (eV) = 15

Reagent

---

**LCPFUdA\_00005**

Scanned  
10/14/16 R: SBC 9/13/16



730535  
ID: LCPFUdA\_00005  
Exp: 08/19/20 Prpd: SBC  
PF-n-undecanoic acid



730536  
ID: LCPFUdA\_00006  
Exp: 08/19/20 Prpd: SBC  
PF-n-undecanoic acid



**WELLINGTON**  
LABORATORIES

**CERTIFICATE OF ANALYSIS**  
**DOCUMENTATION**

**PRODUCT CODE:**

PFUdA

**LOT NUMBER:**

PFUdA0815

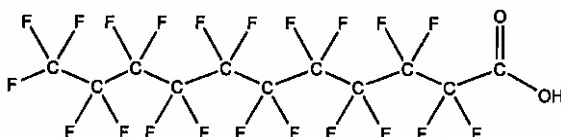
**COMPOUND:**

Perfluoro-n-undecanoic acid

**STRUCTURE:**

**CAS #:**

2058-94-8



**MOLECULAR FORMULA:**

$C_{11}H_{21}O_2$

**MOLECULAR WEIGHT:**

564.09

**CONCENTRATION:**

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

**SOLVENT(S):**

Methanol

Water (<1%)

**CHEMICAL PURITY:**

>98%

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

08/19/2015

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

08/19/2020

**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:** 08/21/2015

(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:**

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:**

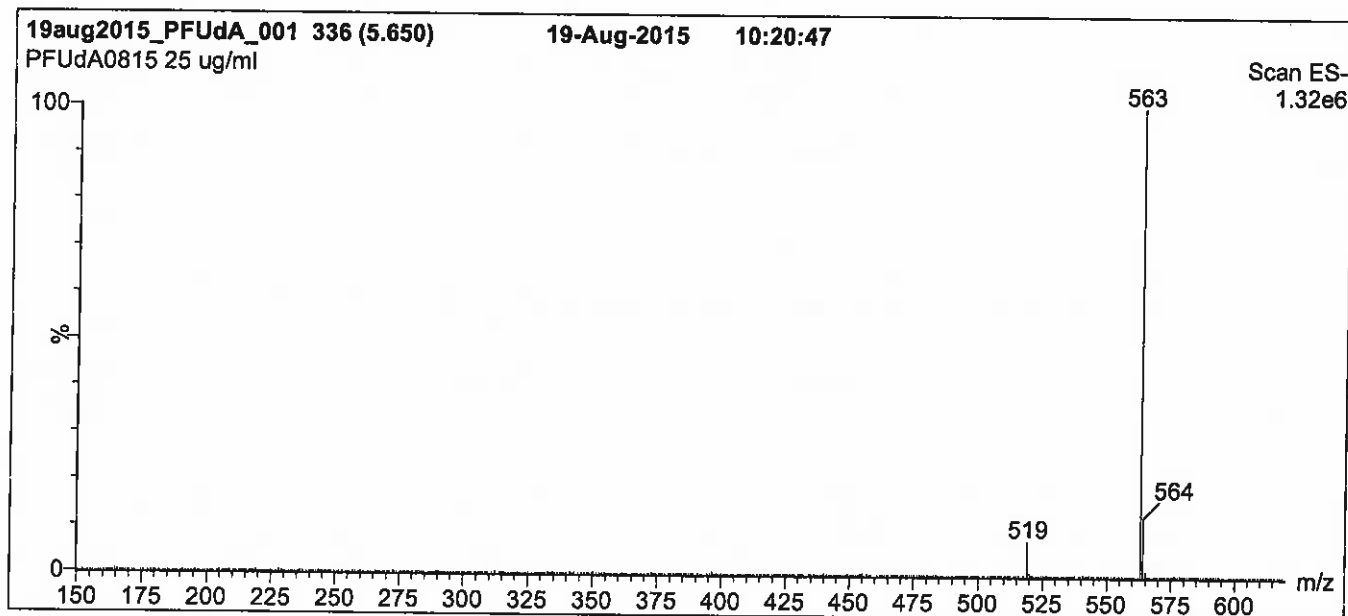
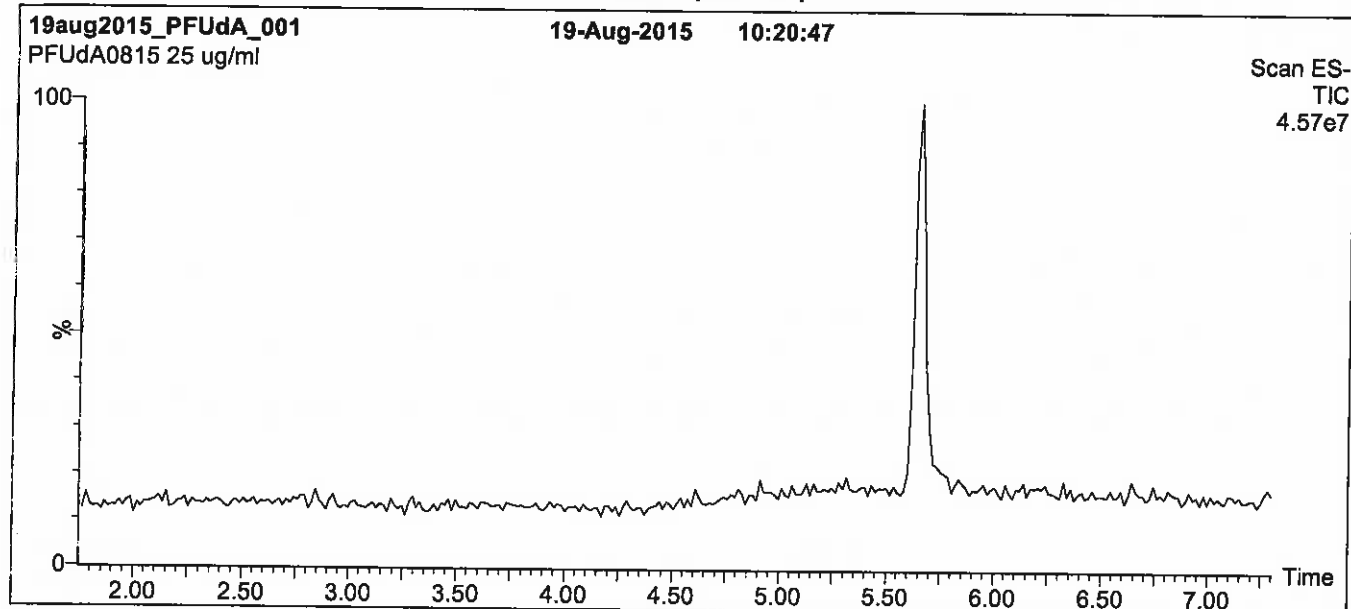
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).



**\*\*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:** PFUdA; 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

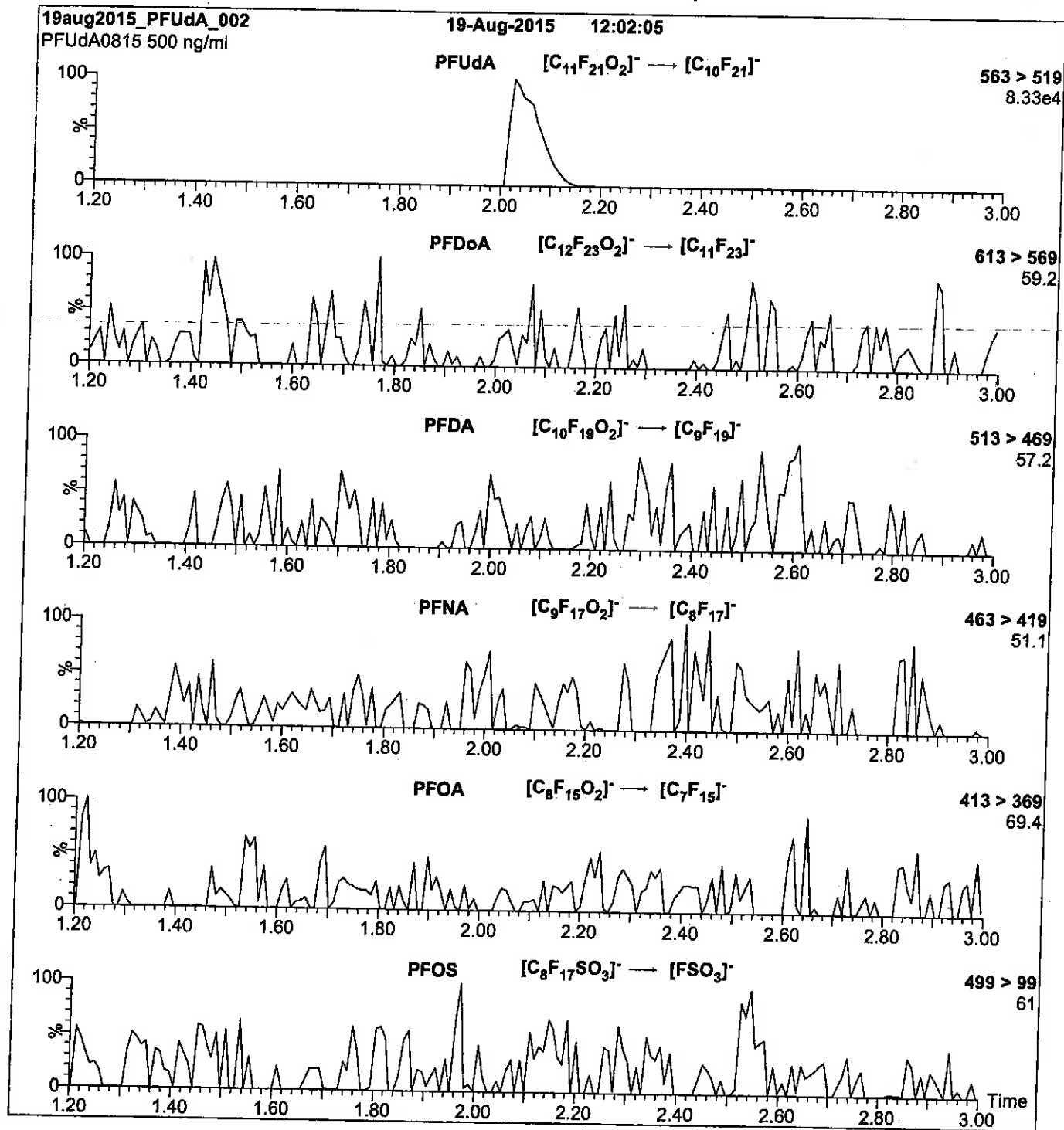
Flow: 300  $\mu$ l/min

**MS Parameters**

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)  
Capillary Voltage (kV) = 3.00  
Cone Voltage (V) = 15.00  
Cone Gas Flow (l/hr) = 65  
Desolvation Gas Flow (l/hr) = 750

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



**Conditions for Figure 2:**

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

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) = 3.31e-3  
Collision Energy (eV) = 11

Reagent

---

**MS14DIC\_00007**



110 Benner Circle  
 Bellefonte, PA 16823-8812  
 Tel: (800)356-1688  
 Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



**FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.**

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 31853 Lot No.: A0124653  
 Description : 1,4-dioxane  
1,4-Dioxane 2,000µg/mL, Methylene Chloride, 1mL/ampul  
 Container Size : 2 mL Pkg Amt: > 1 mL  
 Expiration Date : February 28, 2022 Storage: 0°C or colder

### CERTIFIED VALUES

| Elution Order | Compound                                                       | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2)                                                        |
|---------------|----------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|
| 1             | 1,4-Dioxane<br>CAS # 123-91-1<br>Purity 99%<br>(Lot SHBG6312V) | 1,984.0 µg/mL               | +/- 11.7844 µg/mL Gravimetric<br>+/- 42.5460 µg/mL Unstressed<br>+/- 43.7790 µg/mL Stressed |

Solvent: Methylene Chloride (MEOH FREE)  
 CAS # 75-09-2  
 Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

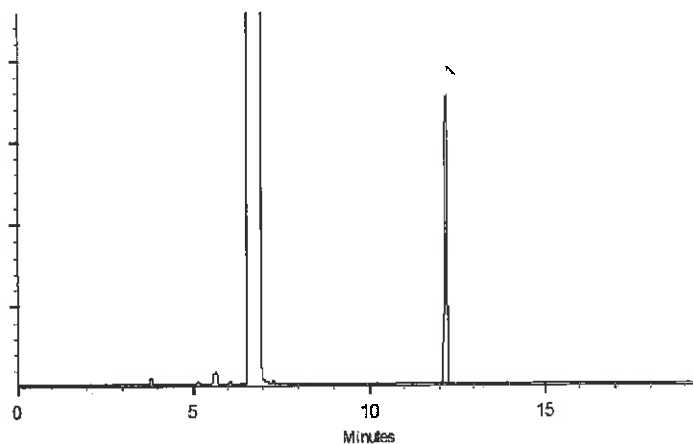
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Tom Suckal - Mix Technician

Date Mixed: 02-Feb-2017

Balance: 1128360905

  
Justine Albertson - Operations Tech-ARM GC

Date Passed: 06-Feb-2017

Manufactured under Restek's ISO 9001:2008  
Registered Quality System  
Certificate #FM 80397

Reagent

---

**MS14DTA\_00022**

## Certificate of Analysis

Description: 1,4-Dioxane, 1x1ml, methanol, 2000ug/ml

Catalog Number: CRM48367

Lot Number: LC16305V

Expiration: September 2018

Storage: Room Temperature

Instructions for Use:

This sample is ready to use.  
No additional sample preparation  
is necessary.

| Analyte     | CAS<br>Number | Certified<br>Conc. ug/mL | Uncertainty<br>ug/mL | k    |
|-------------|---------------|--------------------------|----------------------|------|
| 1,4-Dioxane | 123-91-1      | 2000                     | +/- 58.2             | 2.00 |

Manufactured and certified by Sigma-Aldrich RTC, Inc.



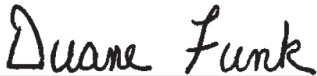
Page 1 of 2

**SIGMA-ALDRICH**<sup>®</sup>

Notes:

- Certified value – based on a prepared to value and analytically verified by RTC with associated uncertainties from the preparation and analytical procedures.
- Expanded Uncertainty – Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a t-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies.
- k: Coverage factor derived from a t-distribution table, based on the degrees of freedom of the data set. Confidence interval = 95%
- Traceability: The standard was manufactured under an ISO/IEC certified quality system. The balance used to weight raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SMRs were available or other certified reference material as specified by each analyte.
- Homogeneity: Homogeneity was assessed in accordance with ISO Guide 35. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See instructions for minimum sub-sample size.

Certification Date: 9/25/2015  
Form: CRM48367

  
\_\_\_\_\_  
Duane Funk  
QC Manager

Manufactured and certified by Sigma-Aldrich RTC, Inc.



Page 2 of 2

**SIGMA-ALDRICH®**





Reagent

---

**MS14DTA\_00023**



110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 31853 Lot No.: A0121319  
Description : 1,4-dioxane  
1,4-Dioxane 2,000µg/mL, Methylene Chloride, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : August 31, 2021 Storage: 0°C or colder

### CERTIFIED VALUES

| Elution Order | Compound                                                       | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2)                                                        |
|---------------|----------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------|
| 1             | 1,4-Dioxane<br>CAS # 123-91-1<br>Purity 99%<br>(Lot SHBG1461V) | 2,001.0 µg/mL               | +/- 11.7430 µg/mL Gravimetric<br>+/- 42.8714 µg/mL Unstressed<br>+/- 44.1160 µg/mL Stressed |

Solvent: Methylene Chloride (MEOH FREE)  
CAS # 75-09-2  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

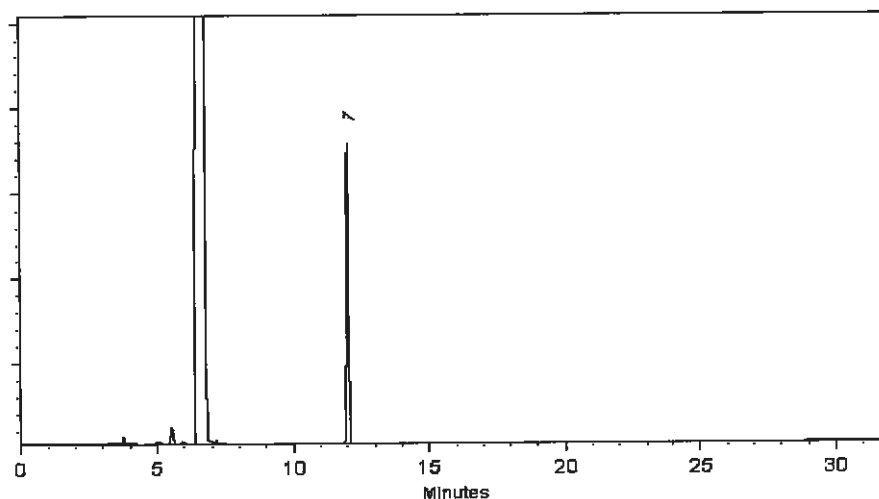
200°C

**Det. Temp:**

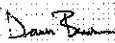
250°C

**Det. Type:**

FID

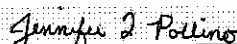


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Dawn Brownson - Mix Technician

Date Mixed: 31-Aug-2016

Balance: 1128360905

  
Jennifer L. Pollino - QC Analyst

Date Passed: 02-Sep-2016

Manufactured under Restek's ISO 9001:2008  
Registered Quality System  
Certificate #FM 80397

Reagent

---

**MS8270IS\_00016**



110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 567684 **Lot No.:** A0120796

**Description :** 8270 Internal Standard

8270 Internal Standard 2,000µg/mL, Methylene Chloride, 5mL/ampul

**Container Size :** 5 mL **Pkg Amt:** > 5 mL

**Expiration Date :** August 31, 2021 **Storage:** 10°C or colder

**Handling:** Sonication required. Mix is photosensitive.

### CERTIFIED VALUES

| Elution Order | Compound                                                               | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L., K=2)                                                         |
|---------------|------------------------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------|
| 1             | 1,4-Dichlorobenzene-d4<br>CAS # 3855-82-1 (Lot PR-18488)<br>Purity 99% | 2,008.2 µg/mL               | +/- 11.6758 µg/mL Gravimetric<br>+/- 90.4505 µg/mL Unstressed<br>+/- 100.3660 µg/mL Stressed |
| 2             | Naphthalene-d8<br>CAS # 1146-65-2 (Lot M-1452)<br>Purity 99%           | 2,004.0 µg/mL               | +/- 11.6514 µg/mL Gravimetric<br>+/- 90.2614 µg/mL Unstressed<br>+/- 100.1561 µg/mL Stressed |
| 3             | Acenaphthene-d10<br>CAS # 15067-26-2 (Lot PR-25444)<br>Purity 99%      | 2,007.7 µg/mL               | +/- 11.6729 µg/mL Gravimetric<br>+/- 90.4280 µg/mL Unstressed<br>+/- 100.3410 µg/mL Stressed |
| 4             | Phenanthrene-d10<br>CAS # 1517-22-2 (Lot PR-23065)<br>Purity 99%       | 2,011.4 µg/mL               | +/- 11.6945 µg/mL Gravimetric<br>+/- 90.5947 µg/mL Unstressed<br>+/- 100.5260 µg/mL Stressed |
| 5             | Chrysene-d12<br>CAS # 1719-03-5 (Lot PR-26678)<br>Purity 98%           | 2,018.8 µg/mL               | +/- 11.7375 µg/mL Gravimetric<br>+/- 90.9280 µg/mL Unstressed<br>+/- 100.8958 µg/mL Stressed |
| 6             | Perylene-d12<br>CAS # 1520-96-3 (Lot PR-24113)<br>Purity 99%           | 2,002.6 µg/mL               | +/- 11.6433 µg/mL Gravimetric<br>+/- 90.1983 µg/mL Unstressed<br>+/- 100.0862 µg/mL Stressed |

**Solvent:** Methylene Chloride  
**CAS #** 75-09-2  
**Purity** 99%

**Column:**  
30m x 0.25mm x 0.25µm  
Rtx-5 (cat.#10223)

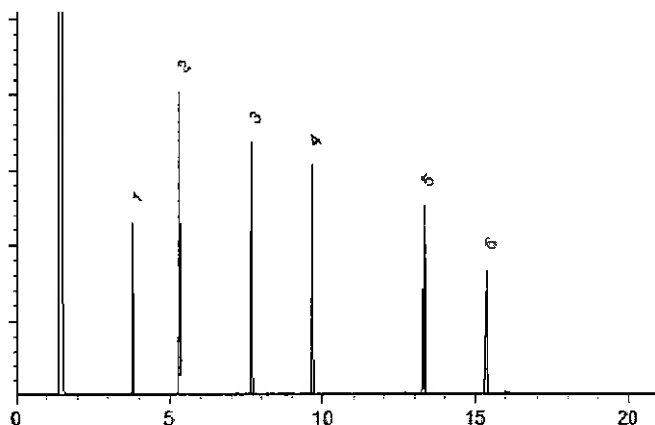
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

**Temp. Program:**  
75°C (hold 1 min.) to 330°C  
@ 20°C/min. (hold 10 min.)

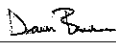
**Inj. Temp:**  
250°C

**Det. Temp:**  
330°C

**Det. Type:**  
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Dawn Brownson - Mix Technician

**Date Mixed:** 03-Aug-2016 **Balance:** 1128353505

  
Dawn Brownson - QC Analyst

**Date Passed:** 05-Aug-2016

Manufactured under Restek's ISO 9001:2008  
Registered Quality System  
Certificate #FM 80397

Reagent

---

**MS8270SU\_00094**





**CERTIFIED REFERENCE MATERIAL**

110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# Certificate of Analysis



## FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 570814 **Lot No.:** A0117528

**Description :** 8270 Surrogate Standard RTS with Indicator

8270 Surrogate Standard RTS with Indicator 100 µg/ml,  
Methanol/Methylene Chloride (95:5), 100 ml/bottle

**Container Size :** 100 mL **Pkg Amt:** > 100 mL

**Expiration Date :** February 28, 2019 **Storage:** 10°C or colder

**Handling:** Sonicate prior to use.

## CERTIFIED VALUES

| Elution Order | Compound                                                               | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L.; K=2) |       |             |
|---------------|------------------------------------------------------------------------|-----------------------------|--------------------------------------|-------|-------------|
| 1             | 2-Fluorophenol<br>CAS # 367-12-4<br>Purity 99%<br>(Lot STBC5591V)      | 100.5 µg/mL                 | +/- 0.5843                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9326                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5586                           | µg/mL | Stressed    |
| 2             | Phenol-d5<br>CAS # 4165-62-2<br>Purity 99%<br>(Lot X479P8)             | 100.2 µg/mL                 | +/- 0.5827                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9250                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5494                           | µg/mL | Stressed    |
| 3             | Nitrobenzene-d5<br>CAS # 4165-60-0<br>Purity 99%<br>(Lot PR-24042)     | 100.0 µg/mL                 | +/- 0.5814                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9183                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5413                           | µg/mL | Stressed    |
| 4             | 2-Fluorobiphenyl<br>CAS # 321-60-8<br>Purity 99%<br>(Lot S26B003)      | 100.0 µg/mL                 | +/- 0.5815                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9186                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5416                           | µg/mL | Stressed    |
| 5             | 2,4,6-Tribromophenol<br>CAS # 118-79-6<br>Purity 99%<br>(Lot 29699MJV) | 100.6 µg/mL                 | +/- 0.5846                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9344                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5608                           | µg/mL | Stressed    |
| 6             | p-Terphenyl-d14<br>CAS # 1718-51-0<br>Purity 99%<br>(Lot PR-21037)     | 100.0 µg/mL                 | +/- 0.5814                           | µg/mL | Gravimetric |
|               |                                                                        |                             | +/- 2.9183                           | µg/mL | Unstressed  |
|               |                                                                        |                             | +/- 3.5413                           | µg/mL | Stressed    |

**Solvent:** Methanol/Methylene Chloride (95:5)  
**CAS #** 67-56-1/75-09-2  
**Purity** 99%

**Tech Tips:**

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

**Column:**

30m x 0.25mm x 0.25µm  
Rtx-S (cat.#10223)

**Carrier Gas:**

hydrogen-constant flow 1.8 mL/min.

**Temp. Program:**

80°C (hold 0.1 min.) to 330°C  
@ 9.6°C/min. (hold 0.86 min.)

**Inj. Temp:**

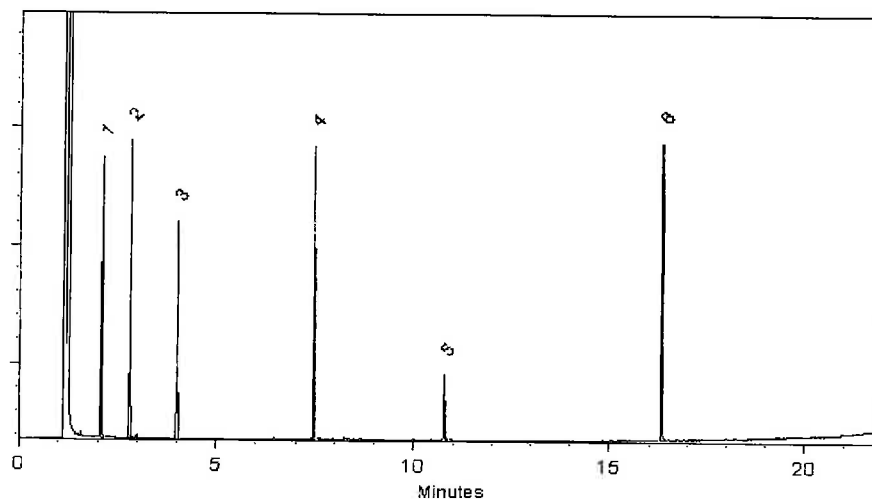
250°C

**Det. Temp:**

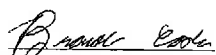
340°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Brandon Cook - Mix Technician

Date Mixed: 23-Feb-2016

Balance: B442140311

  
Amanda Miller - QC Analyst

Date Passed: 26-Feb-2016

Manufactured under Restek's ISO 9001:2008  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO Guides 34 and 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

| Label Conditions                | Standard Conditions | Non-Standard Conditions |
|---------------------------------|---------------------|-------------------------|
| 25°C Nominal (Room Temperature) | < 60°C              | ≥ 60°C up to 7 days     |
| 10°C or colder (Refrigerate)    | < 40°C              | ≥ 40°C up to 7 days     |
| 0°C or colder (Freezer)         | < 25°C              | ≥ 25°C up to 7 days     |

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Reagent

---

**MS8270SU\_00100**



# CERTIFIED REFERENCE MATERIAL

110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 567685 Lot No.: A0103960  
Description : 8270 Surrogate Standard  
8270 Surrogate Standard 5,000 ug/ml, Methylene Chloride, 5 ml/ampul  
Container Size : 5 mL Pkg Amt: > 5 mL  
Expiration Date : June 30, 2019 Storage: 10°C or colder  
Handling: Sonicate prior to use.

Rec'd 4/22/16

### CERTIFIED VALUES

| Elution Order | Compound                                                            | Grav. Conc. (weight/volume) | Expanded Uncertainty (95% C.L., K=2)                                                          |
|---------------|---------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------|
| 1             | 2-Fluorophenol<br>CAS # 367-12-4 (Lot STBC5591V)<br>Purity 99%      | 5,006.1 µg/mL               | +/- 29.1044 µg/mL Gravimetric<br>+/- 124.7363 µg/mL Unstressed<br>+/- 156.8636 µg/mL Stressed |
| 2             | Phenol-d5<br>CAS # 4165-62-2 (Lot X479P6)<br>Purity 99%             | 5,002.5 µg/mL               | +/- 29.0834 µg/mL Gravimetric<br>+/- 124.6466 µg/mL Unstressed<br>+/- 156.7508 µg/mL Stressed |
| 3             | Nitrobenzene-d5<br>CAS # 4165-60-0 (Lot PR-20474)<br>Purity 99%     | 5,003.7 µg/mL               | +/- 29.0901 µg/mL Gravimetric<br>+/- 124.6753 µg/mL Unstressed<br>+/- 156.7868 µg/mL Stressed |
| 4             | 2-Fluorobiphenyl<br>CAS # 321-60-8 (Lot B19Z016)<br>Purity 99%      | 5,002.4 µg/mL               | +/- 29.0826 µg/mL Gravimetric<br>+/- 124.6429 µg/mL Unstressed<br>+/- 156.7461 µg/mL Stressed |
| 5             | 2,4,6-Tribromophenol<br>CAS # 118-79-6 (Lot 29699MJV)<br>Purity 99% | 5,024.2 µg/mL               | +/- 29.2093 µg/mL Gravimetric<br>+/- 125.1861 µg/mL Unstressed<br>+/- 157.4292 µg/mL Stressed |
| 6             | p-Terphenyl-d14<br>CAS # 1718-51-0 (Lot PR-20577)<br>Purity 99%     | 5,010.4 µg/mL               | +/- 29.1291 µg/mL Gravimetric<br>+/- 124.8422 µg/mL Unstressed<br>+/- 156.9968 µg/mL Stressed |

Solvent: Methylene Chloride  
CAS # 75-09-2  
Purity 99%

**Tech Tips:**

Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

**Column:**

30m x 0.25mm x 0.25µm  
Rtx-5 (cat.#10223)

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

40°C (hold 2 min.) to 330°C  
@ 10°C/min. (hold 10 min.)

**Inj. Temp:**

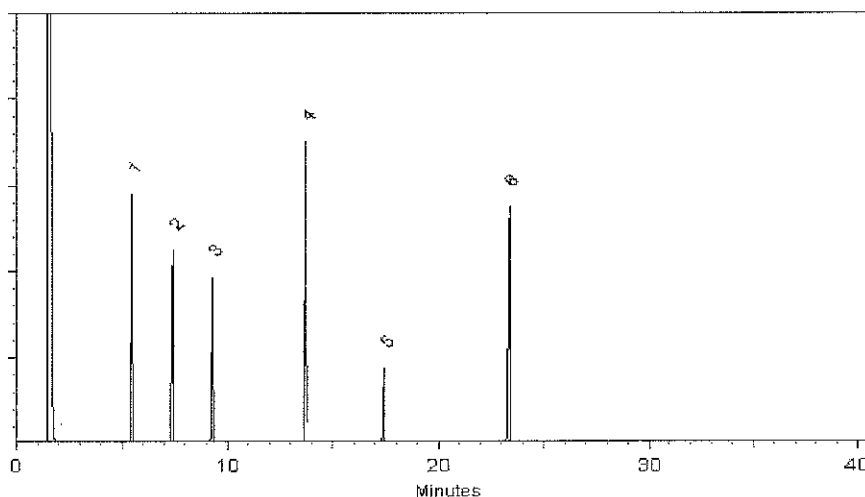
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Rebecca Hawes*

Date Mixed: 11-Jun-2014 Balance: 1128360905

*Jennifer L. Pollino*

Jennifer L. Pollino - QC Analyst

Date Passed: 23-Jun-2014

Manufactured under Restek's ISO 9001:2008  
Registered Quality System  
Certificate #FM 80397

# Method 8270C SIM

---

Semivolatile Organic Compounds  
(GC/MS SIM) by Method 8270C (SIM)

FORM II  
GC/MS SEMI VOA SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-26324-1

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

Matrix: Water

Level: Low

GC Column (1): HP-5MS ID: 0.25 (mm)

| Client Sample ID   | Lab Sample ID          | NBZ # |
|--------------------|------------------------|-------|
| MEAFF-EB03-GW-0317 | 320-26324-5            | 76    |
| MEAFF-EB04-GW-0317 | 320-26324-6            | 74    |
|                    | MB<br>320-153806/1-A   | 69    |
|                    | LCS<br>320-153806/2-A  | 75    |
|                    | LCSD<br>320-153806/3-A | 71    |

NBZ = Nitrobenzene-d5

QC LIMITS  
42-91

# Column to be used to flag recovery values

FORM II WS-MS-0011



FORM III  
GC/MS SEMI VOA LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Matrix: Water Level: Low Lab File ID: S031417.D  
Lab ID: LCS 320-153806/2-A Client ID: \_\_\_\_\_

| COMPOUND    | SPIKE<br>ADDED<br>(ug/L) | LCS<br>CONCENTRATION<br>(ug/L) | LCS<br>%<br>REC | QC<br>LIMITS<br>REC | # |
|-------------|--------------------------|--------------------------------|-----------------|---------------------|---|
| 1,4-Dioxane | 10.0                     | 3.17                           | 32              | 12-52               | M |

# Column to be used to flag recovery and RPD values

FORM III  
GC/MS SEMI VOA LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: S031418.D  
 Lab ID: LCSD 320-153806/3-A Client ID: \_\_\_\_\_

| COMPOUND    | SPIKE<br>ADDED<br>(ug/L) | LCSD<br>CONCENTRATION<br>(ug/L) | LCSD<br>%<br>REC | %<br>RPD | QC LIMITS |       | # |
|-------------|--------------------------|---------------------------------|------------------|----------|-----------|-------|---|
|             |                          |                                 |                  |          | RPD       | REC   |   |
| 1,4-Dioxane | 10.0                     | 3.12                            | 31               | 2        | 20        | 12-52 | M |

# Column to be used to flag recovery and RPD values

FORM IV  
GC/MS SEMI VOA METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Lab File ID: S031416.D Lab Sample ID: MB 320-153806/1-A  
Matrix: Water Date Extracted: 03/08/2017 08:41  
Instrument ID: SV1 Date Analyzed: 03/14/2017 20:43  
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 320-153806/2-A  | S031417.D      | 03/14/2017 21:06 |
|                    | LCSD 320-153806/3-A | S031418.D      | 03/14/2017 21:28 |
| MEAFF-EB03-GW-0317 | 320-26324-5         | S031425.D      | 03/15/2017 00:04 |
| MEAFF-EB04-GW-0317 | 320-26324-6         | S031426.D      | 03/15/2017 00:27 |

FORM VIII  
GC/MS SEMI VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: ICIS 320-151686/5 Date Analyzed: 02/22/2017 11:03  
 Instrument ID: SV1 GC Column: HP-5MS ID: 0.25 (mm)  
 Lab File ID (Standard): 14D0222E.D Heated Purge: (Y/N) N  
 Calibration ID: 28577

|                               |                    | DCBd4   |      |        |      |        |      |
|-------------------------------|--------------------|---------|------|--------|------|--------|------|
|                               |                    | AREA #  | RT # | AREA # | RT # | AREA # | RT # |
| INITIAL CALIBRATION MID-POINT |                    | 786305  | 7.20 |        |      |        |      |
| UPPER LIMIT                   |                    | 1572610 | 7.70 |        |      |        |      |
| LOWER LIMIT                   |                    | 393153  | 6.70 |        |      |        |      |
| LAB SAMPLE ID                 | CLIENT SAMPLE ID   |         |      |        |      |        |      |
| ICV 320-151686/9              |                    | 879747  | 7.20 |        |      |        |      |
| CCV 320-154875/2              |                    | 683060  | 7.17 |        |      |        |      |
| MB 320-153806/1-A             |                    | 769575  | 7.17 |        |      |        |      |
| LCS 320-153806/2-A            |                    | 633634  | 7.17 |        |      |        |      |
| LCSD 320-153806/3-A           |                    | 692706  | 7.18 |        |      |        |      |
| 320-26324-5                   | MEAFF-EB03-GW-0317 | 626627  | 7.18 |        |      |        |      |
| 320-26324-6                   | MEAFF-EB04-GW-0317 | 604274  | 7.17 |        |      |        |      |
| CCVC 320-154875/29            |                    | 679174  | 7.17 |        |      |        |      |

DCBd4 = 1,4-Dichlorobenzene-d4

Area Limit = 50%-200% of internal standard area  
 RT Limit =  $\pm$  0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB03-GW-0317 Lab Sample ID: 320-26324-5  
 Matrix: Water Lab File ID: S031425.D  
 Analysis Method: WS-MS-0011 Date Collected: 03/03/2017 14:00  
 Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
 Sample wt/vol: 883.4 (mL) Date Analyzed: 03/15/2017 00:04  
 Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
 Injection Volume: 1 (uL) Level: (low/med) Low  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 0.57   | U | 1.1 | 0.57 | 0.23 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 76   |   | 42-91  |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031425.D  
 Lims ID: 320-26324-D-5-A  
 Client ID: MEAFF-EB03-GW-0317  
 Sample Type: Client  
 Inject. Date: 15-Mar-2017 00:04:30 ALS Bottle#: 25 Worklist Smp#: 27  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-d-5-a  
 Operator ID: Instrument ID: SV1  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 14:53:08 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK013

First Level Reviewer: chajjita

Date: 15-Mar-2017 14:32:52

| Sig | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q | Response | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|-----|--------------|------------------|------------------|---|----------|--------------------|-------------|-------|-------|
|-----|--------------|------------------|------------------|---|----------|--------------------|-------------|-------|-------|

|                            |       |       |       |    |        |      |            |      |  |
|----------------------------|-------|-------|-------|----|--------|------|------------|------|--|
| 1 1,4-Dioxane              |       |       |       |    |        |      |            |      |  |
| 58                         |       | 3.320 |       |    |        | ND   |            |      |  |
| 88                         |       | 3.320 |       |    |        |      |            |      |  |
| * 2 1,4-Dichlorobenzene-d4 |       |       |       |    |        |      |            |      |  |
| 152                        | 7.181 | 7.172 | 0.009 | 96 | 626627 | 10.0 | 80- 120    | 100  |  |
| 150                        | 7.181 | 7.172 | 0.009 |    | 965638 |      | 135- 175   | 154  |  |
| 115                        | 7.173 | 7.172 | 0.001 |    | 367862 |      | 35.8- 75.8 | 58.7 |  |
| \$ 3 Nitrobenzene-d5       |       |       |       |    |        |      |            |      |  |
| 82                         | 8.043 | 8.035 | 0.008 | 94 | 288388 | 3.81 | 80- 120    | 100  |  |
| 128                        | 8.043 | 8.035 | 0.008 |    | 154496 |      | 33.8- 73.8 | 53.6 |  |
| 54                         | 8.035 | 8.035 | 0.000 |    | 166484 |      | 37.5- 77.5 | 57.7 |  |

**Reagents:**

MS8270IS\_00016 Amount Added: 5.00 Units: uL Run Reagent

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031425.D

Injection Date: 15-Mar-2017 00:04:30

Instrument ID: SV1

Operator ID:

Lims ID: 320-26324-D-5-A

Lab Sample ID: 320-26324-5

Worklist Smp#: 27

Client ID: MEAFF-EB03-GW-0317

Injection Vol: 1.0 ul

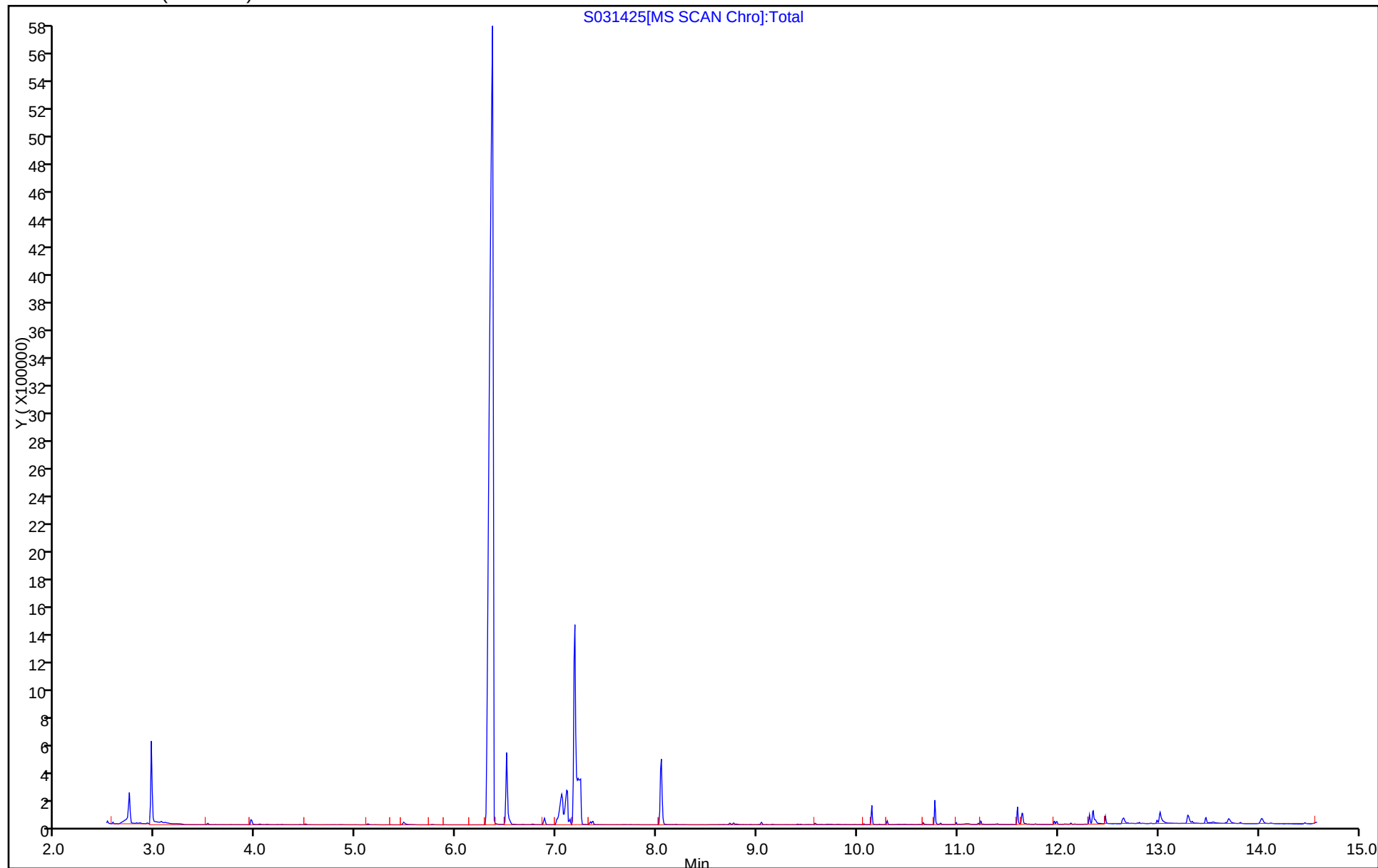
Dil. Factor: 1.0000

ALS Bottle#: 25

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031425.D  
Lims ID: 320-26324-D-5-A  
Client ID: MEAFF-EB03-GW-0317  
Sample Type: Client  
Inject. Date: 15-Mar-2017 00:04:30 ALS Bottle#: 25 Worklist Smp#: 27  
Injection Vol: 1.0 ul Dil. Factor: 1.0000  
Sample Info: 320-26324-d-5-a  
Operator ID: Instrument ID: SV1  
Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
Limit Group: MSS - 8270SIM 14DX - ICAL  
Last Update: 15-Mar-2017 14:53:08 Calib Date: 22-Feb-2017 12:09:30  
Integrator: RTE ID Type: RT Order ID  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
Process Host: XAWRK013

First Level Reviewer: chajjita

Date: 15-Mar-2017 14:32:52

| Compound             | Amount Added | Amount Recovered | % Rec. |
|----------------------|--------------|------------------|--------|
| \$ 3 Nitrobenzene-d5 | 5.00         | 3.81             | 76.22  |



FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB04-GW-0317 Lab Sample ID: 320-26324-6  
 Matrix: Water Lab File ID: S031426.D  
 Analysis Method: WS-MS-0011 Date Collected: 03/03/2017 15:35  
 Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
 Sample wt/vol: 933.6(mL) Date Analyzed: 03/15/2017 00:27  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 1(uL) Level: (low/med) Low  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 0.54   | U | 1.1 | 0.54 | 0.21 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 74   |   | 42-91  |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031426.D  
 Lims ID: 320-26324-C-6-A  
 Client ID: MEAFF-EB04-GW-0317  
 Sample Type: Client  
 Inject. Date: 15-Mar-2017 00:27:30 ALS Bottle#: 26 Worklist Smp#: 28  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-c-6-a  
 Operator ID: Instrument ID: SV1  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 14:53:08 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK013

First Level Reviewer: chajjita

Date: 15-Mar-2017 14:53:25

| Sig | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q | Response | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|-----|--------------|------------------|------------------|---|----------|--------------------|-------------|-------|-------|
|-----|--------------|------------------|------------------|---|----------|--------------------|-------------|-------|-------|

|                            |       |       |       |     |        |      |            |      |  |
|----------------------------|-------|-------|-------|-----|--------|------|------------|------|--|
| 1 1,4-Dioxane              |       |       |       |     |        |      |            |      |  |
| 58                         |       | 3.320 |       |     |        | ND   |            |      |  |
| 88                         |       | 3.320 |       |     |        |      |            |      |  |
| * 2 1,4-Dichlorobenzene-d4 |       |       |       |     |        |      |            |      |  |
| 152                        | 7.173 | 7.172 | 0.001 | 100 | 604274 | 10.0 | 80- 120    | 100  |  |
| 150                        | 7.173 | 7.172 | 0.001 |     | 934721 |      | 135- 175   | 155  |  |
| 115                        | 7.173 | 7.172 | 0.001 |     | 334431 |      | 35.8- 75.8 | 55.3 |  |
| \$ 3 Nitrobenzene-d5       |       |       |       |     |        |      |            |      |  |
| 82                         | 8.036 | 8.035 | 0.001 | 100 | 268877 | 3.68 | 80- 120    | 100  |  |
| 128                        | 8.036 | 8.035 | 0.001 |     | 144469 |      | 33.8- 73.8 | 53.7 |  |
| 54                         | 8.036 | 8.035 | 0.001 |     | 154407 |      | 37.5- 77.5 | 57.4 |  |

**Reagents:**

MS8270IS\_00016 Amount Added: 5.00 Units: uL Run Reagent

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031426.D

Injection Date: 15-Mar-2017 00:27:30

Instrument ID: SV1

Operator ID:

Lims ID: 320-26324-C-6-A

Lab Sample ID: 320-26324-6

Worklist Smp#: 28

Client ID: MEAFF-EB04-GW-0317

Injection Vol: 1.0 ul

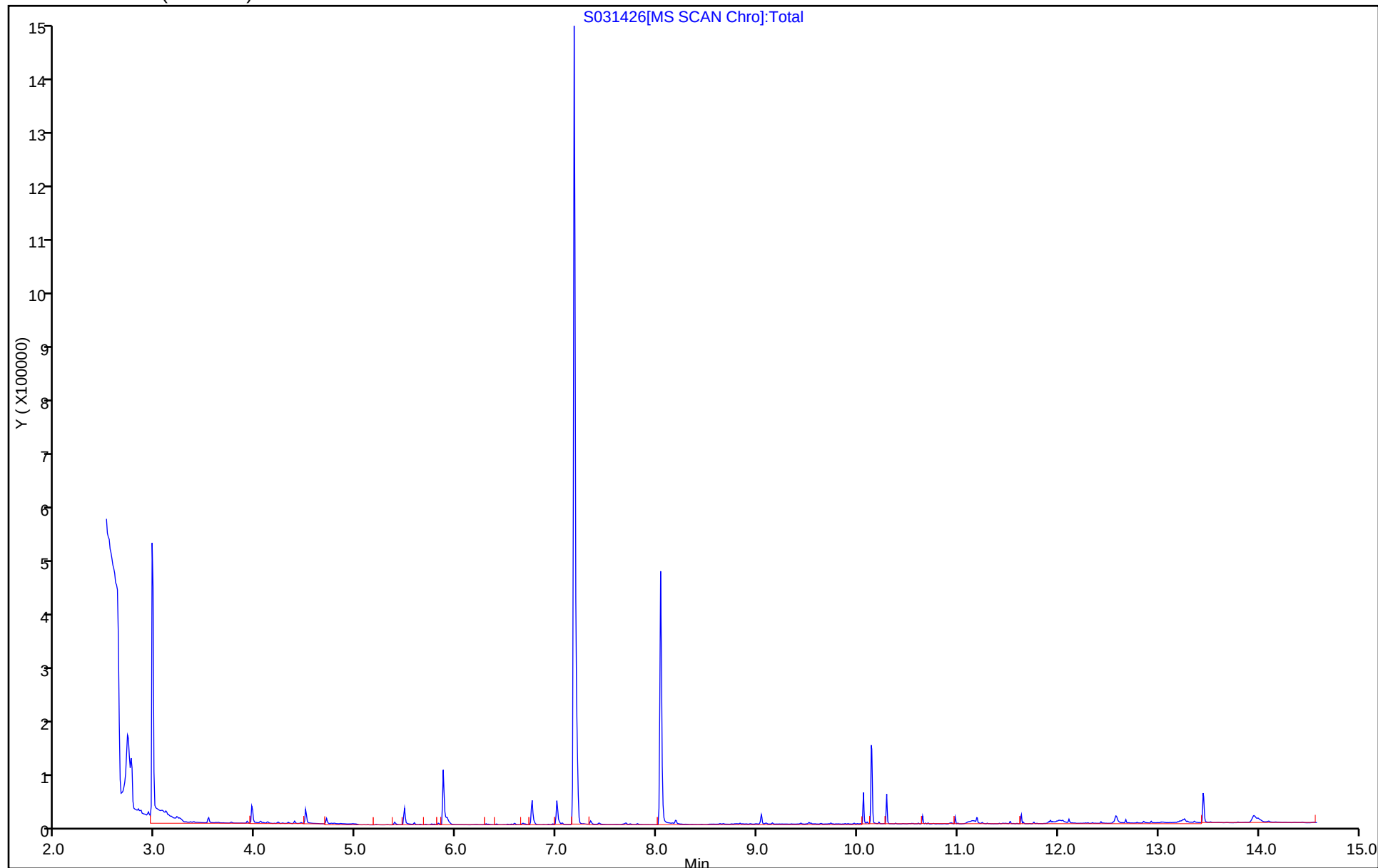
Dil. Factor: 1.0000

ALS Bottle#: 26

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031426.D  
Lims ID: 320-26324-C-6-A  
Client ID: MEAFF-EB04-GW-0317  
Sample Type: Client  
Inject. Date: 15-Mar-2017 00:27:30 ALS Bottle#: 26 Worklist Smp#: 28  
Injection Vol: 1.0 ul Dil. Factor: 1.0000  
Sample Info: 320-26324-c-6-a  
Operator ID: Instrument ID: SV1  
Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
Limit Group: MSS - 8270SIM 14DX - ICAL  
Last Update: 15-Mar-2017 14:53:08 Calib Date: 22-Feb-2017 12:09:30  
Integrator: RTE ID Type: RT Order ID  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
Process Host: XAWRK013

First Level Reviewer: chajjita

Date: 15-Mar-2017 14:53:25

| Compound             | Amount Added | Amount Recovered | % Rec. |
|----------------------|--------------|------------------|--------|
| \$ 3 Nitrobenzene-d5 | 5.00         | 3.68             | 73.69  |

FORM VI  
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 151686

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

Instrument ID: SV1 GC Column: HP-5MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/22/2017 09:35 Calibration End Date: 02/22/2017 12:09 Calibration ID: 28577

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:    | LAB FILE ID: |
|---------|-------------------|--------------|
| Level 1 | IC 320-151686/1   | 14D0222A.D   |
| Level 2 | IC 320-151686/2   | 14D0222B.D   |
| Level 3 | IC 320-151686/3   | 14D0222C.D   |
| Level 4 | IC 320-151686/4   | 14D0222D.D   |
| Level 5 | ICIS 320-151686/5 | 14D0222E.D   |
| Level 6 | IC 320-151686/6   | 14D0222F.D   |
| Level 7 | IC 320-151686/7   | 14D0222G.D   |
| Level 8 | IC 320-151686/8   | 14D0222H.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<br>LVL 7   | LVL 3<br>LVL 8   | LVL 4  | LVL 5  |               | B           | M1     | M2 |   |         |      |   |             |               |   |                   |
| 1,4-Dioxane     | 0.4455<br>0.3906 | 0.3950<br>0.4282 | 0.3860<br>0.3515 | 0.4401 | 0.3728 | Ave           |             | 0.4012 |    |   |         | 8.4  |   | 15.0        |               |   |                   |
| Nitrobenzene-d5 | 1.2661<br>1.2121 | 1.1089<br>1.3702 | 1.1243<br>1.1151 | 1.3085 | 1.1565 | Ave           |             | 1.2077 |    |   |         | 8.2  |   | 15.0        |               |   |                   |

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

FORM VI  
GC/MS SEMI VOA BY INTERNAL STANDARD - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 151686

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

Instrument ID: SV1 GC Column: HP-5MS ID: 0.25 (mm) Heated Purge: (Y/N) N

Calibration Start Date: 02/22/2017 09:35 Calibration End Date: 02/22/2017 12:09 Calibration ID: 28577

Calibration Files:

|         |                   |              |
|---------|-------------------|--------------|
| LEVEL:  | LAB SAMPLE ID:    | LAB FILE ID: |
| Level 1 | IC 320-151686/1   | 14D0222A.D   |
| Level 2 | IC 320-151686/2   | 14D0222B.D   |
| Level 3 | IC 320-151686/3   | 14D0222C.D   |
| Level 4 | IC 320-151686/4   | 14D0222D.D   |
| Level 5 | ICIS 320-151686/5 | 14D0222E.D   |
| Level 6 | IC 320-151686/6   | 14D0222F.D   |
| Level 7 | IC 320-151686/7   | 14D0222G.D   |
| Level 8 | IC 320-151686/8   | 14D0222H.D   |

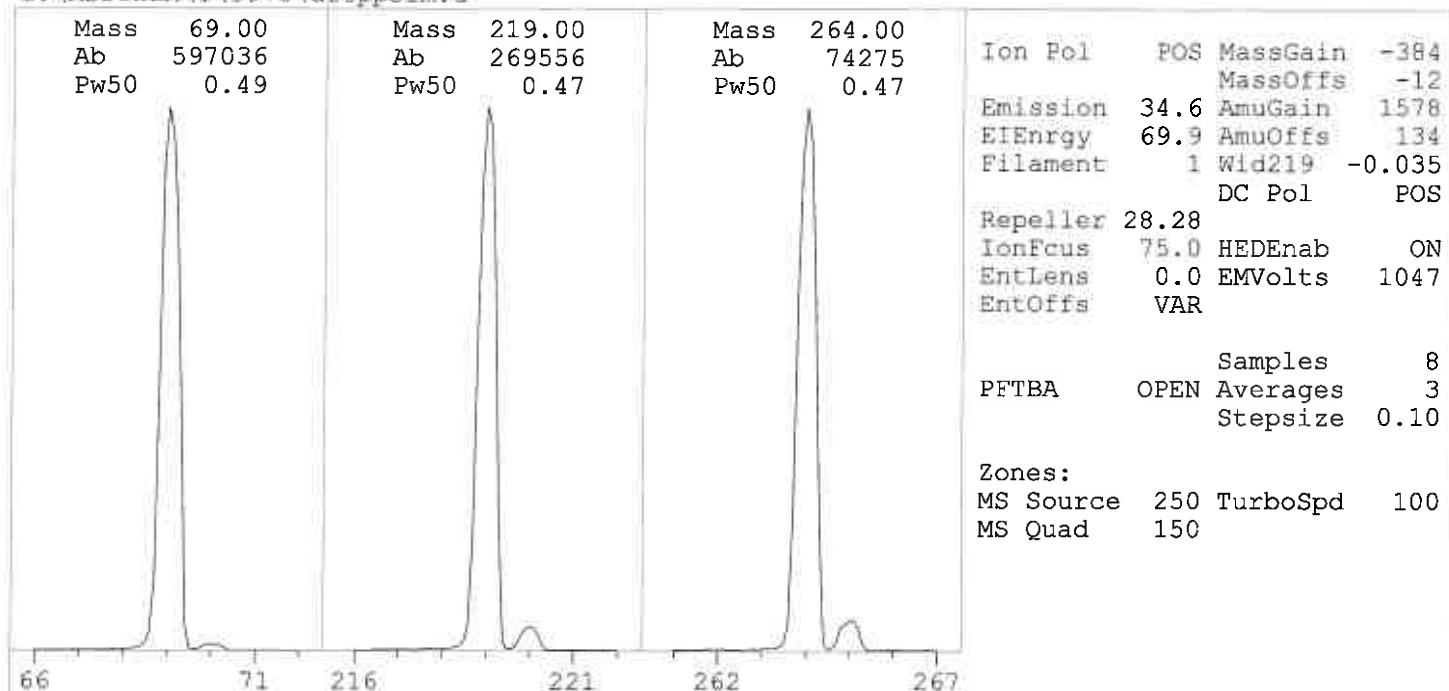
| ANALYTE         | IS<br>REF | CURVE<br>TYPE | RESPONSE         |                  |                   |        |        | CONCENTRATION (UG/ML) |                |                |       |       |
|-----------------|-----------|---------------|------------------|------------------|-------------------|--------|--------|-----------------------|----------------|----------------|-------|-------|
|                 |           |               | LVL 1<br>LVL 6   | LVL 2<br>LVL 7   | LVL 3<br>LVL 8    | LVL 4  | LVL 5  | LVL 1<br>LVL 6        | LVL 2<br>LVL 7 | LVL 3<br>LVL 8 | LVL 4 | LVL 5 |
| 1,4-Dioxane     | DCBd<br>4 | Ave           | 15367<br>570238  | 28517<br>1391248 | 59554<br>2749219  | 150814 | 293131 | 0.500<br>20.0         | 1.00<br>50.0   | 2.00<br>100    | 5.00  | 10.0  |
| Nitrobenzene-d5 | DCBd<br>4 | Ave           | 43667<br>1769342 | 80062<br>4451578 | 173471<br>8721763 | 448379 | 909372 | 0.500<br>20.0         | 1.00<br>50.0   | 2.00<br>100    | 5.00  | 10.0  |

Curve Type Legend:

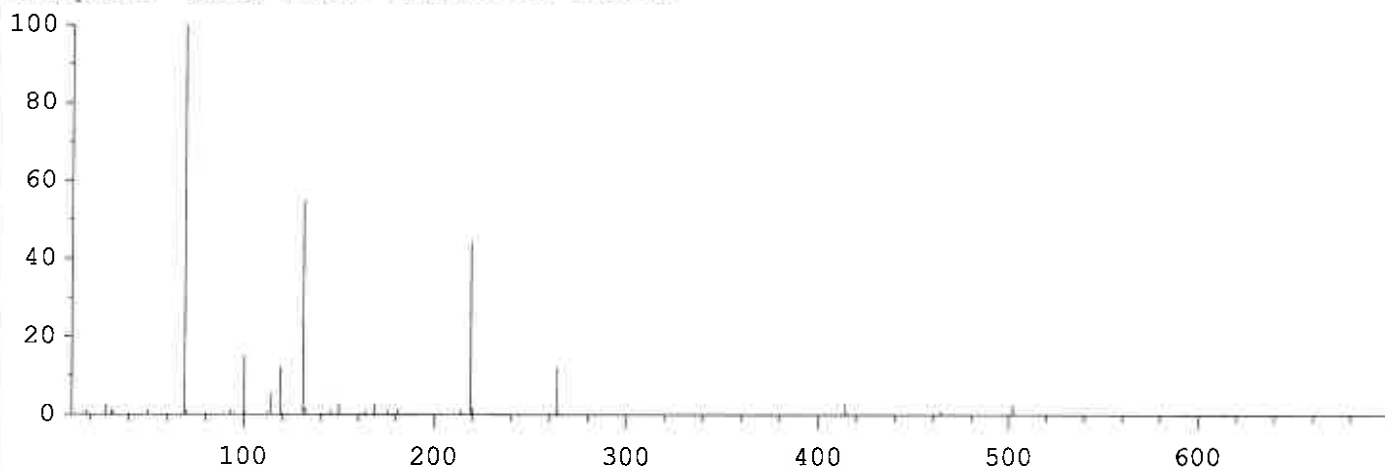
Ave = Average ISTD

Wed Feb 22 09:33:16 2017

C:\MSDCHEM\1\5973\dftppsims.u



Scan: 10.00 - 700.00 Samples: 8 Thresh: 100 Step: 0.10  
126 peaks Base: 69.00 Abundance: 484096



| Mass   | Abund  | Rel Abund | Iso Mass | Iso Abund | Iso Ratio |
|--------|--------|-----------|----------|-----------|-----------|
| 69.00  | 484096 | 100.00    | 70.10    | 5442      | 1.12      |
| 219.00 | 215424 | 44.50     | 220.00   | 9518      | 4.42      |
| 264.00 | 59680  | 12.33     | 265.00   | 3715      | 6.22      |

Air/Water Check: H2O~0.93% N2~2.53% O2~0.67% CO2~0.07% N2/H2O~272.84%

Column Flow: Front: 1.4 Back: 0 ml/min. Interface Temp: 250

#### Ramp Criteria:

Ion Focus Maximum 90 volts using ion 264; EM Gain 158740  
Repeller Maximum 35 volts using ion 219;

MassGain Values @Samples: -384@3 -384@2 -384@1 -384@0 -384@FS

| TARGET MASS:          | 50    | 69    | 131   | 219   | 414   | 502   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Amu Offset:           | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 |
| Entrance Lens Offset: | 14.6  | 12.0  | 13.3  | 12.5  | 13.8  | 12.8  | 12.8  |
| Target Abund(%)       | 1.0   | 100.0 | 55.0  | 45.0  | 3.0   | 2.0   |       |
| Actual Tune Abund(%)  | 1.0   | 100.0 | 55.0  | 44.5  | 3.0   | 2.4   |       |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222A.D  
 Lims ID: IC CS-1  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 22-Feb-2017 09:35:30 ALS Bottle#: 1 Worklist Smp#: 1  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-1 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:26 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 10:04:37

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | S/N   | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 58                         | 3.355        | 3.354            | 0.001            | 78  | 15367    | 0.5000           | 0.5552             | 80- 120     | 100   | 13377 | M     |
| 88                         | 3.355        | 3.354            | 0.001            |     | 19805    |                  |                    | 92- 132     | 129   |       |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 152                        | 7.197        | 7.197            | 0.000            | 99  | 689814   | 10.0             | 10.0               | 80- 120     | 100   |       |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1067566  |                  |                    | 136- 176    | 155   |       |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 393942   |                  |                    | 37.1- 77.1  | 57.1  |       |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 82                         | 8.059        | 8.059            | 0.000            | 100 | 43667    | 0.5000           | 0.5242             | 80- 120     | 100   |       | M     |
| 128                        | 8.059        | 8.059            | 0.000            |     | 20703    |                  |                    | 29.8- 69.8  | 47.4  |       | M     |
| 54                         | 8.059        | 8.059            | 0.000            |     | 25267    |                  |                    | 38.3- 78.3  | 57.9  |       |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL1\_00011

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222A.D

Injection Date: 22-Feb-2017 09:35:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-1

Worklist Smp#: 1

Client ID:

Injection Vol: 1.0 ul

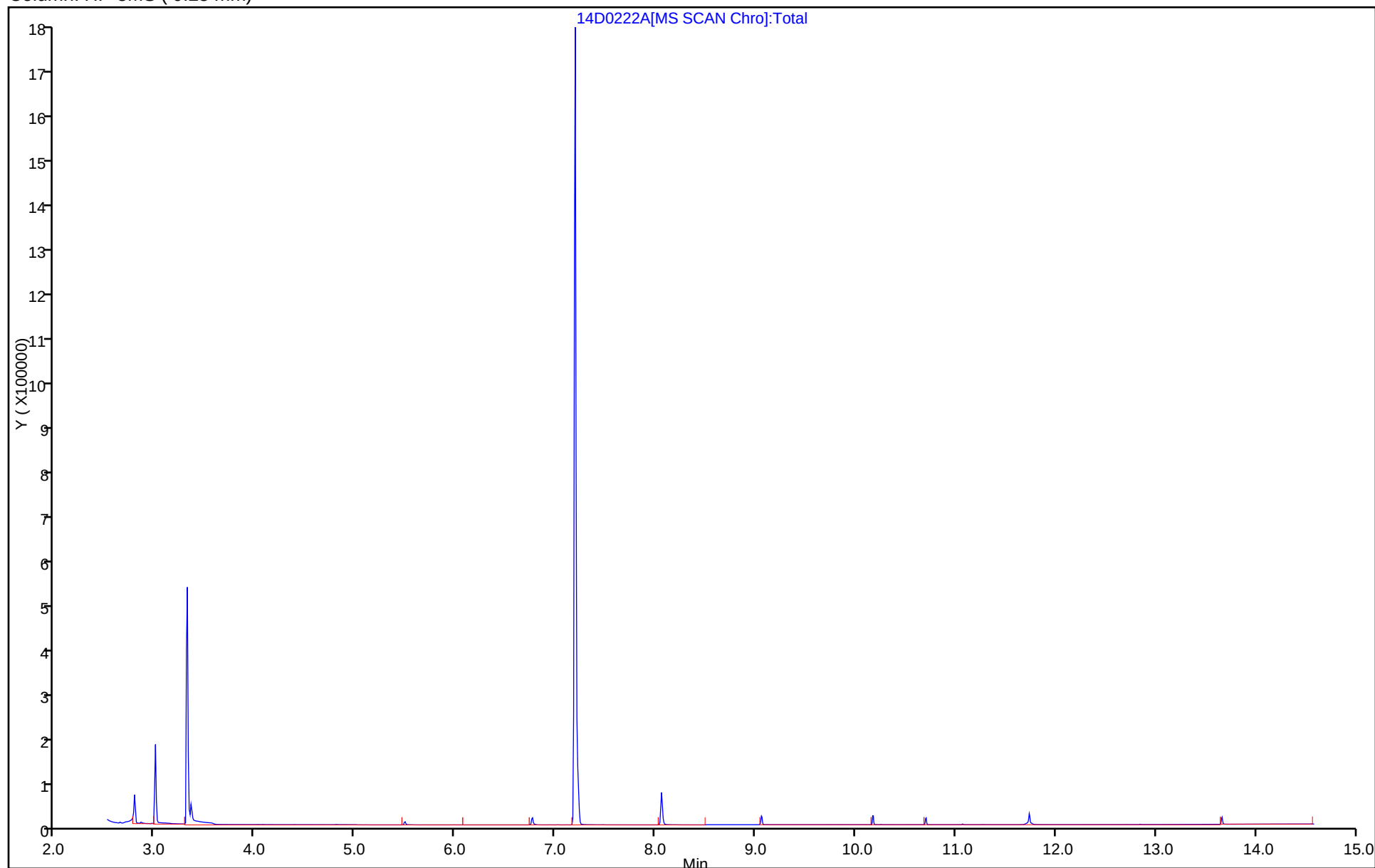
Dil. Factor: 1.0000

ALS Bottle#: 1

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222A.D

Injection Date: 22-Feb-2017 09:35:30

Instrument ID: SV1

Lims ID: IC CS-1

Client ID:

Operator ID:

ALS Bottle#:

1

Worklist Smp#: 1

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

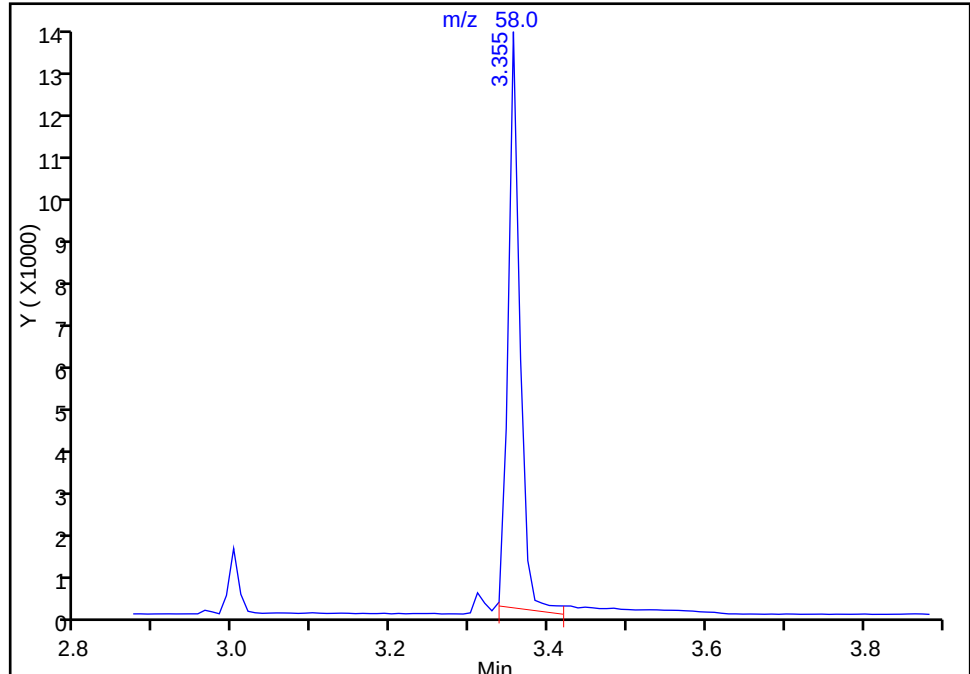
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

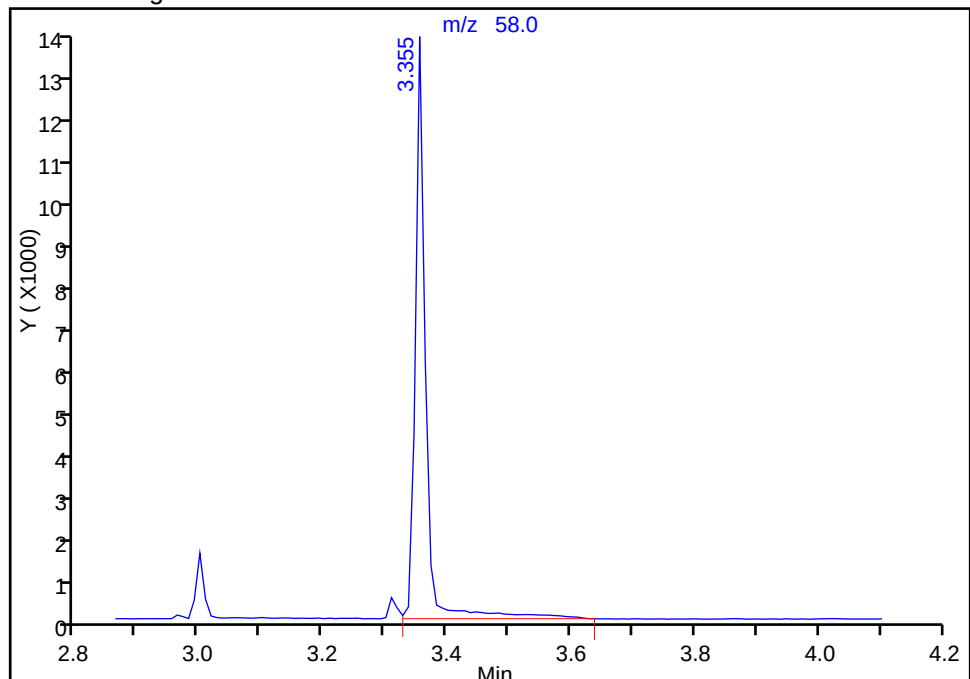
RT: 3.36  
Area: 13722  
Amount: 0.500000  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.36  
Area: 15367  
Amount: 0.555238  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:26

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222A.D

Injection Date: 22-Feb-2017 09:35:30

Instrument ID: SV1

Lims ID: IC CS-1

Client ID:

Operator ID:

ALS Bottle#:

1

Worklist Smp#: 1

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

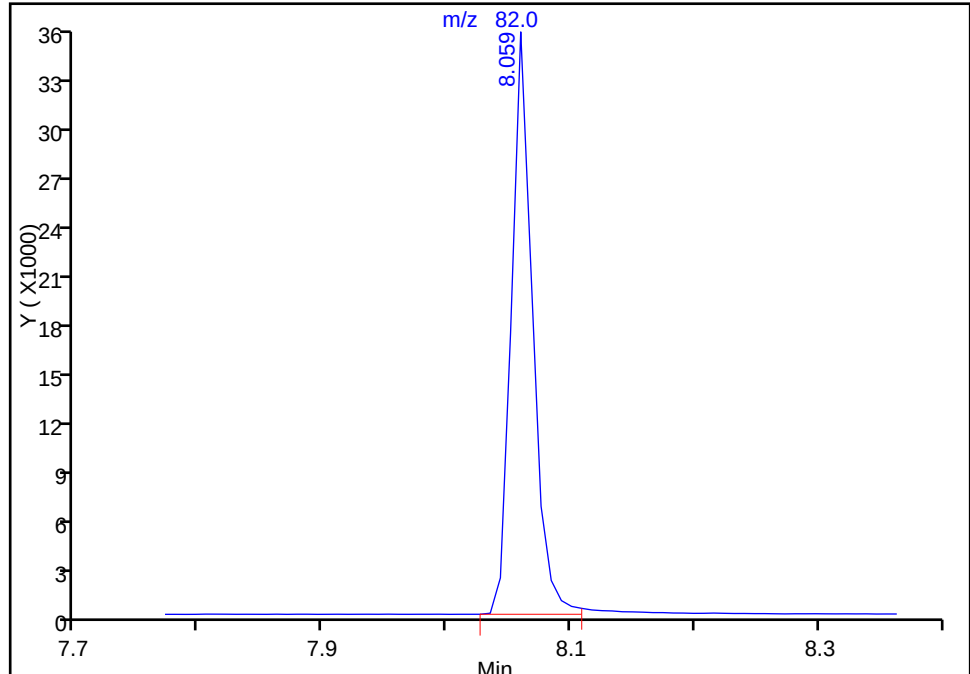
Detector: MS SCAN

## \$ 3 Nitrobenzene-d5, CAS: 4165-60-0

Signal: 1

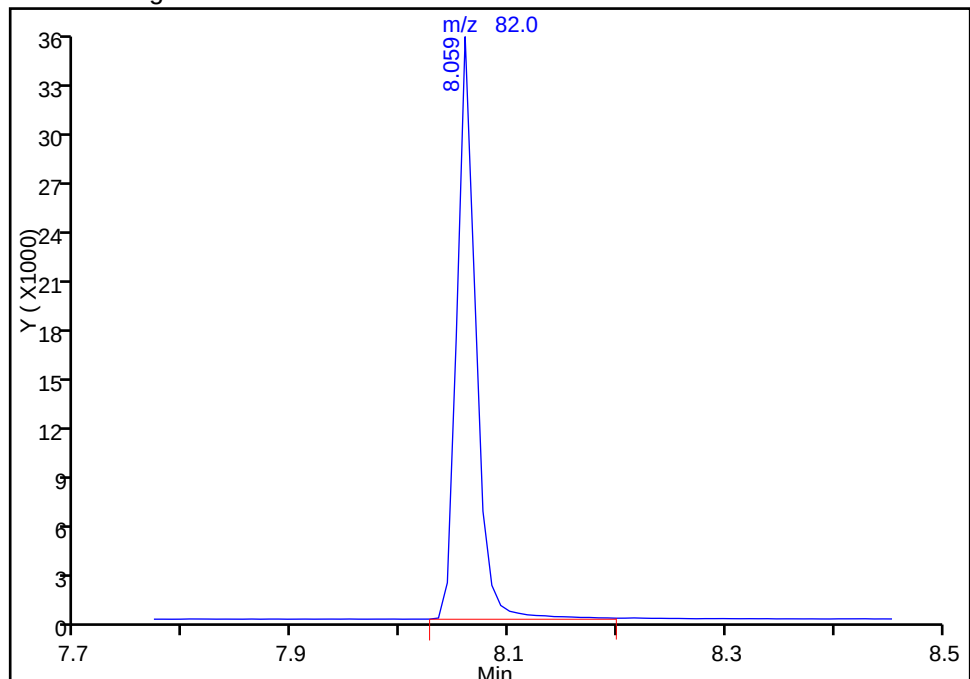
RT: 8.06  
Area: 42828  
Amount: 0.500000  
Amount Units: ug/ml

## Processing Integration Results



RT: 8.06  
Area: 43667  
Amount: 0.524163  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:26

Audit Action: Manually Integrated

Audit Reason: Peak Tail

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222B.D  
 Lims ID: IC CS-2  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 22-Feb-2017 09:56:30 ALS Bottle#: 2 Worklist Smp#: 2  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-2 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:27 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 10:17:50

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.355        | 3.354            | 0.001            | 97  | 28517    | 1.00             | 0.9844             | 80- 120     | 100   | M     |
| 88                         | 3.364        | 3.354            | 0.010            |     | 33413    |                  |                    | 92- 132     | 117   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.197        | 7.197            | 0.000            | 100 | 721993   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1123841  |                  |                    | 136- 176    | 156   |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 416847   |                  |                    | 37.1- 77.1  | 57.7  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.060        | 8.059            | 0.001            | 99  | 80062    | 1.00             | 0.9182             | 80- 120     | 100   | M     |
| 128                        | 8.060        | 8.059            | 0.001            |     | 38136    |                  |                    | 29.8- 69.8  | 47.6  |       |
| 54                         | 8.060        | 8.059            | 0.001            |     | 46077    |                  |                    | 38.3- 78.3  | 57.6  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL2\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222B.D

Injection Date: 22-Feb-2017 09:56:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-2

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

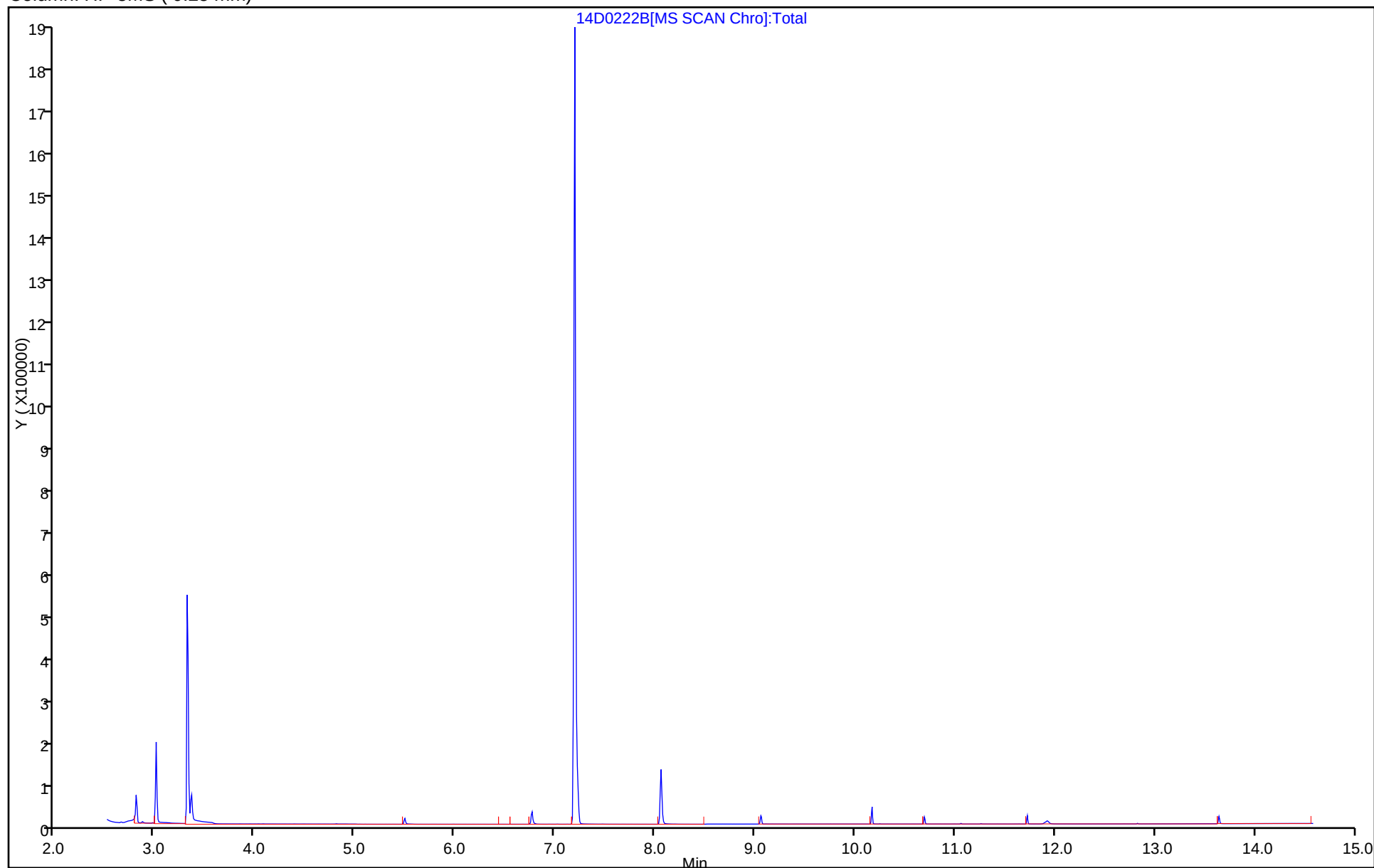
Dil. Factor: 1.0000

ALS Bottle#: 2

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222B.D

Injection Date: 22-Feb-2017 09:56:30

Instrument ID: SV1

Lims ID: IC CS-2

Client ID:

Operator ID:

ALS Bottle#:

2

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

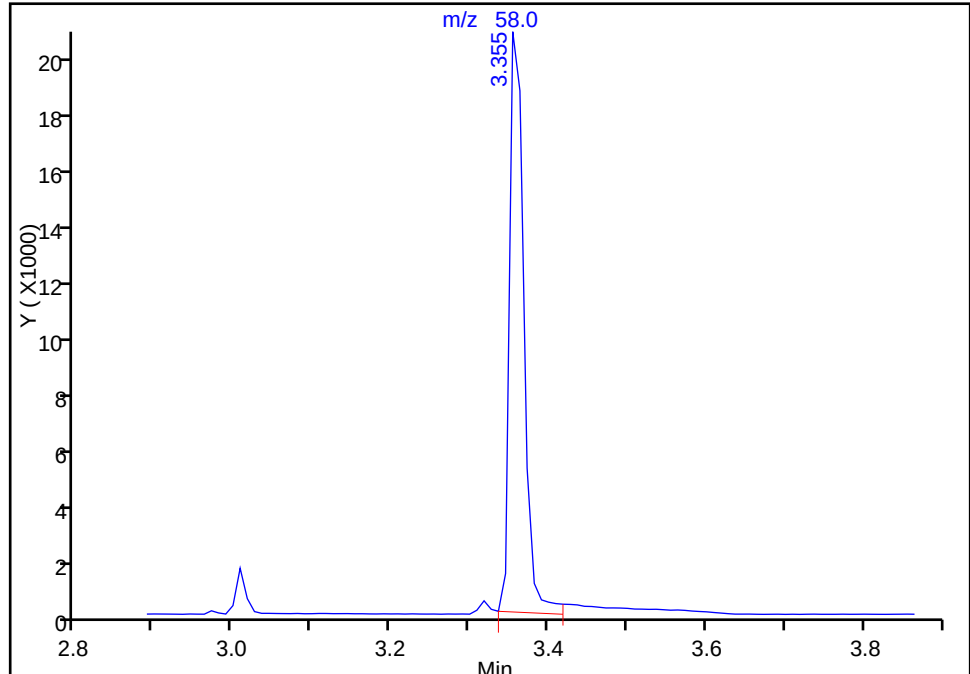
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

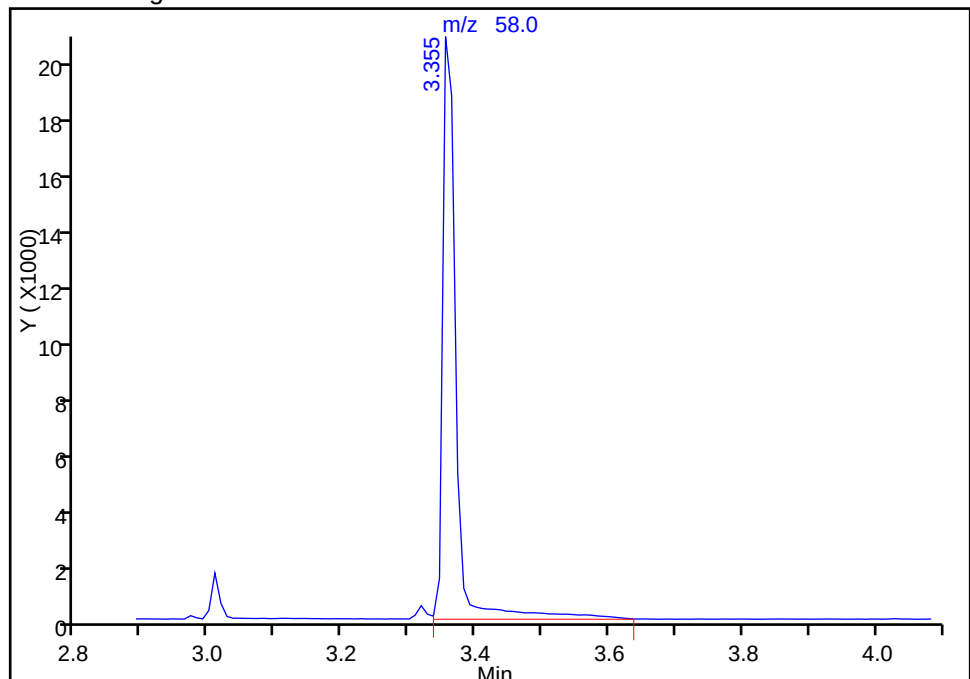
RT: 3.35  
Area: 25950  
Amount: 0.893015  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.35  
Area: 28517  
Amount: 0.984448  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:27

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222B.D

Injection Date: 22-Feb-2017 09:56:30

Instrument ID: SV1

Lims ID: IC CS-2

Client ID:

Operator ID:

ALS Bottle#:

2

Worklist Smp#:

2

Injection Vol: 1.0 ul

Dil. Factor:

1.0000

Method: 1,4-Dioxane

Limit Group:

MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

Detector

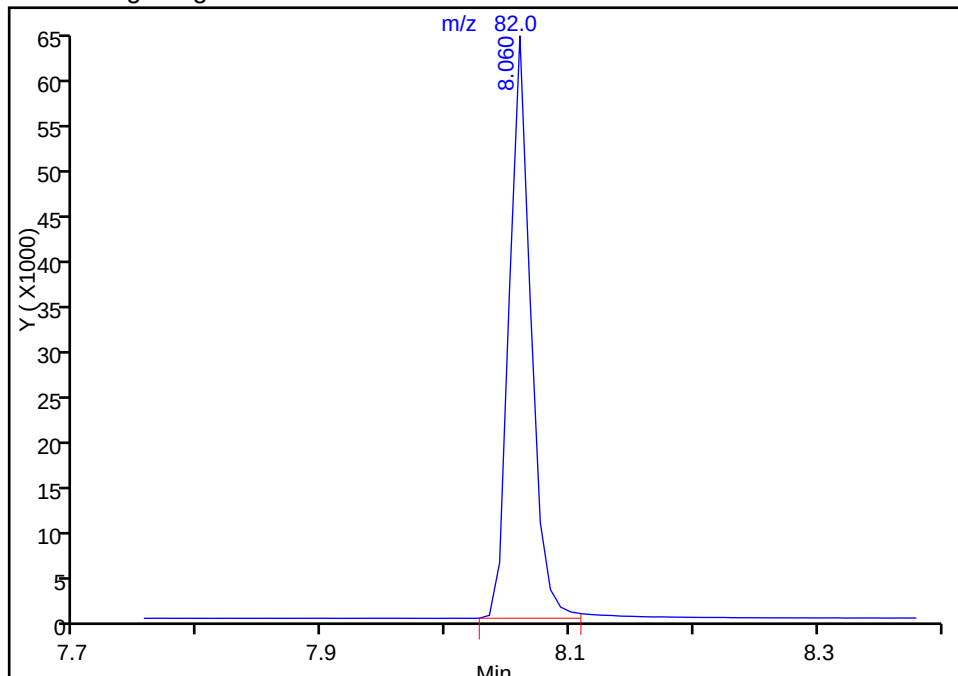
MS SCAN

## \$ 3 Nitrobenzene-d5, CAS: 4165-60-0

Signal: 1

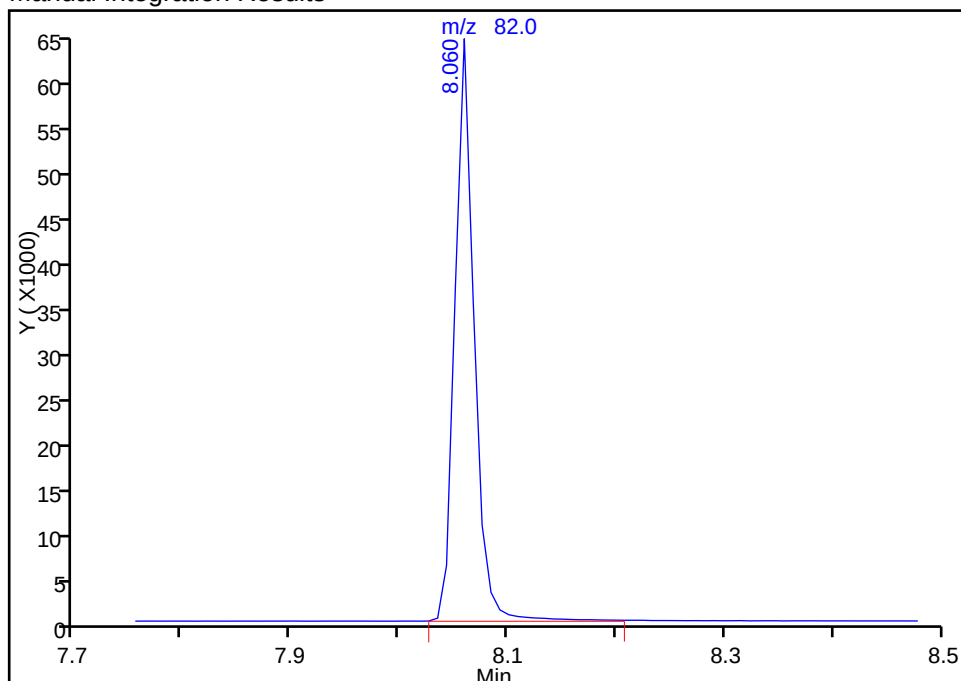
RT: 8.06  
Area: 78635  
Amount: 0.924884  
Amount Units: ug/ml

## Processing Integration Results



RT: 8.06  
Area: 80062  
Amount: 0.918203  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:27

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222C.D  
 Lims ID: IC CS-3  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 22-Feb-2017 10:19:30 ALS Bottle#: 3 Worklist Smp#: 3  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-3 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:28 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 10:46:45

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.357        | 3.354            | 0.003            | 97  | 59554    | 2.00             | 1.92               | 80- 120     | 100   | M     |
| 88                         | 3.366        | 3.354            | 0.012            |     | 69299    |                  |                    | 92- 132     | 116   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.197        | 7.197            | 0.000            | 100 | 771483   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1199044  |                  |                    | 136- 176    | 155   |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 444192   |                  |                    | 37.1- 77.1  | 57.6  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.060        | 8.059            | 0.001            | 97  | 173471   | 2.00             | 1.86               | 80- 120     | 100   | M     |
| 128                        | 8.060        | 8.059            | 0.001            |     | 83892    |                  |                    | 29.8- 69.8  | 48.4  |       |
| 54                         | 8.060        | 8.059            | 0.001            |     | 99669    |                  |                    | 38.3- 78.3  | 57.5  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL3\_00010

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222C.D

Injection Date: 22-Feb-2017 10:19:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-3

Worklist Smp#: 3

Client ID:

Injection Vol: 1.0 ul

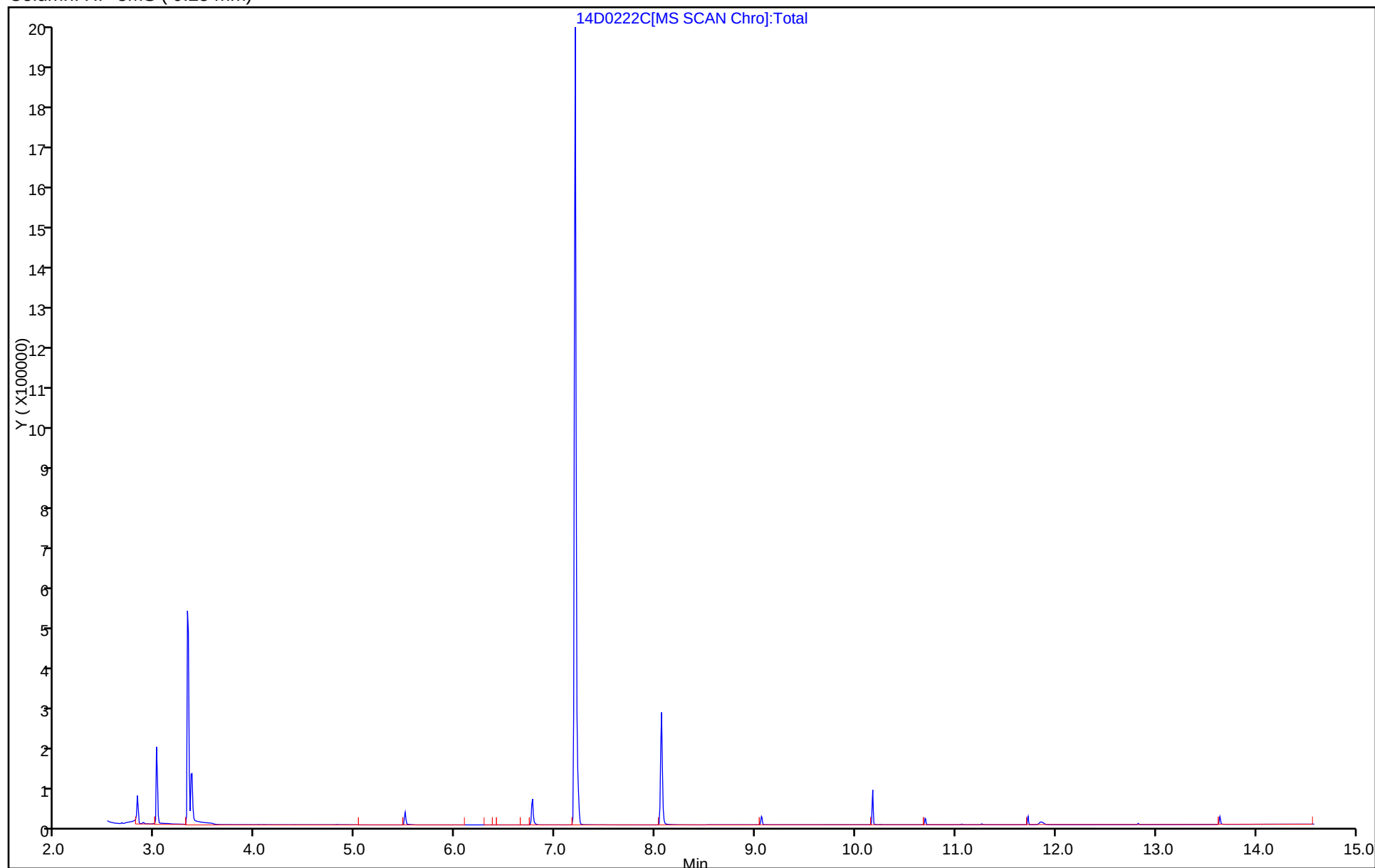
Dil. Factor: 1.0000

ALS Bottle#: 3

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222C.D

Injection Date: 22-Feb-2017 10:19:30

Instrument ID: SV1

Lims ID: IC CS-3

Client ID:

Operator ID:

ALS Bottle#:

3

Worklist Smp#: 3

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

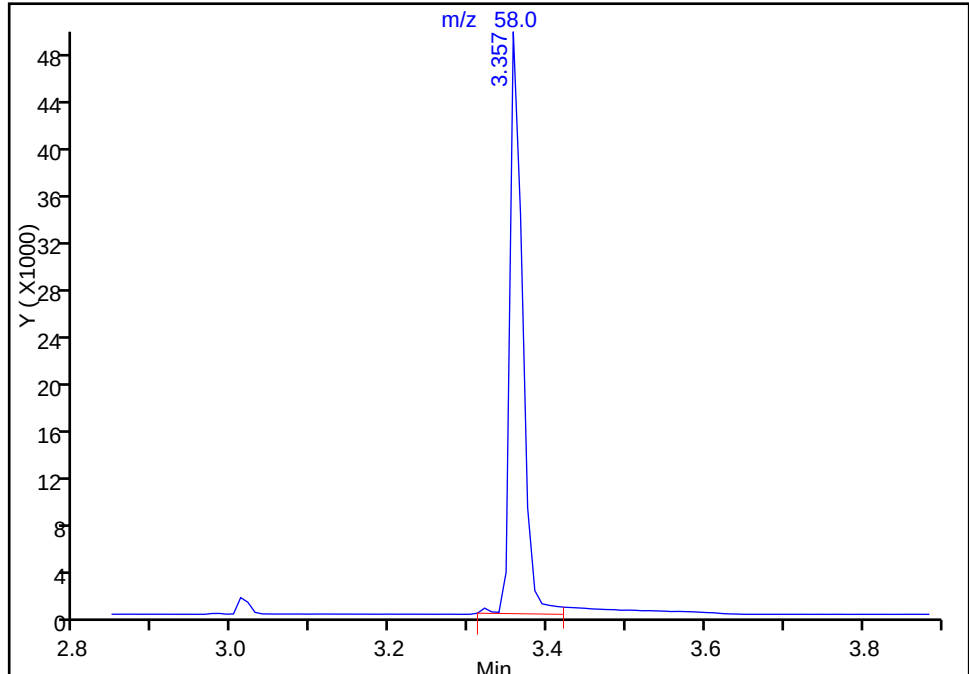
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

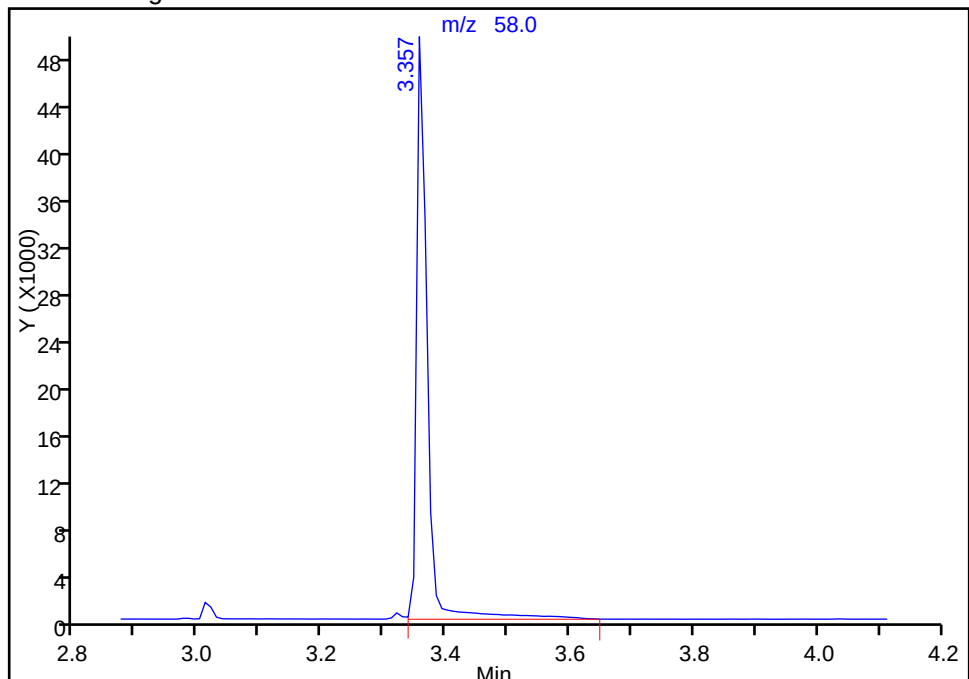
RT: 3.36  
Area: 55647  
Amount: 1.801497  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.36  
Area: 59554  
Amount: 1.924007  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:28

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222C.D

Injection Date: 22-Feb-2017 10:19:30

Instrument ID: SV1

Lims ID: IC CS-3

Client ID:

Operator ID:

ALS Bottle#:

3

Worklist Smp#: 3

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

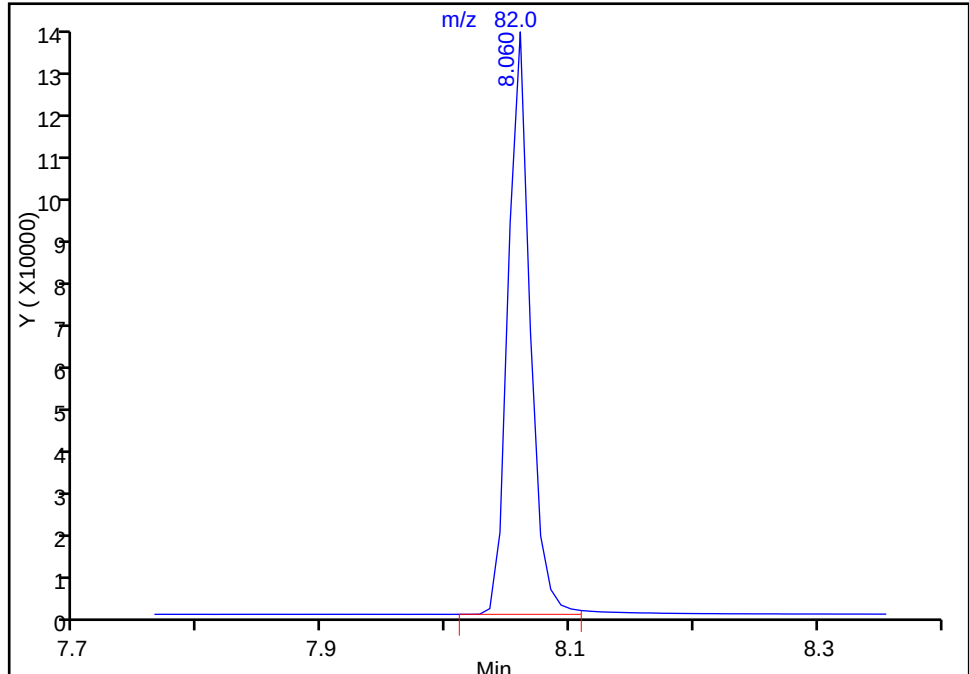
Detector: MS SCAN

## \$ 3 Nitrobenzene-d5, CAS: 4165-60-0

Signal: 1

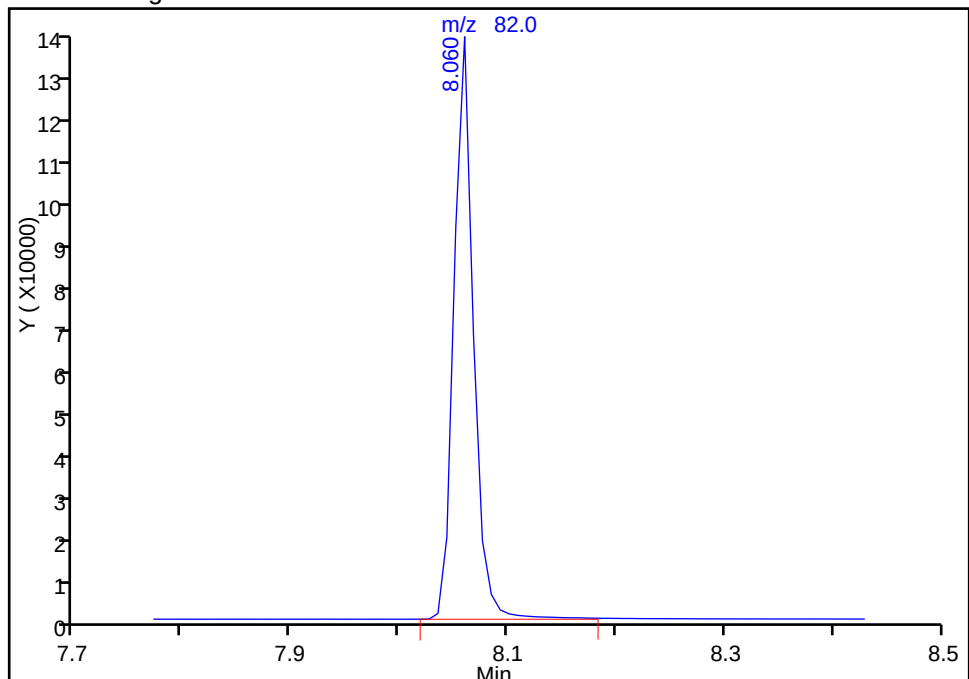
RT: 8.06  
Area: 171502  
Amount: 1.912842  
Amount Units: ug/ml

## Processing Integration Results



RT: 8.06  
Area: 173471  
Amount: 1.861855  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:28

Audit Action: Manually Integrated

Audit Reason: Peak Tail

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222D.D  
 Lims ID: IC CS-4  
 Client ID:  
 Sample Type: IC Calib Level: 4  
 Inject. Date: 22-Feb-2017 10:41:30 ALS Bottle#: 4 Worklist Smp#: 4  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-4 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:29 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 11:21:20

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.345        | 3.354            | -0.009           | 96  | 150814   | 5.00             | 5.48               | 80- 120     | 100   | M     |
| 88                         | 3.354        | 3.354            | 0.000            |     | 168162   |                  |                    | 92- 132     | 112   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.197        | 7.197            | 0.000            | 100 | 685347   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1065860  |                  |                    | 136- 176    | 156   |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 391582   |                  |                    | 37.1- 77.1  | 57.1  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.060        | 8.059            | 0.001            | 97  | 448379   | 5.00             | 5.42               | 80- 120     | 100   |       |
| 128                        | 8.060        | 8.059            | 0.001            |     | 223263   |                  |                    | 29.8- 69.8  | 49.8  |       |
| 54                         | 8.051        | 8.059            | -0.008           |     | 261235   |                  |                    | 38.3- 78.3  | 58.3  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL4\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222D.D

Injection Date: 22-Feb-2017 10:41:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-4

Worklist Smp#: 4

Client ID:

Injection Vol: 1.0 ul

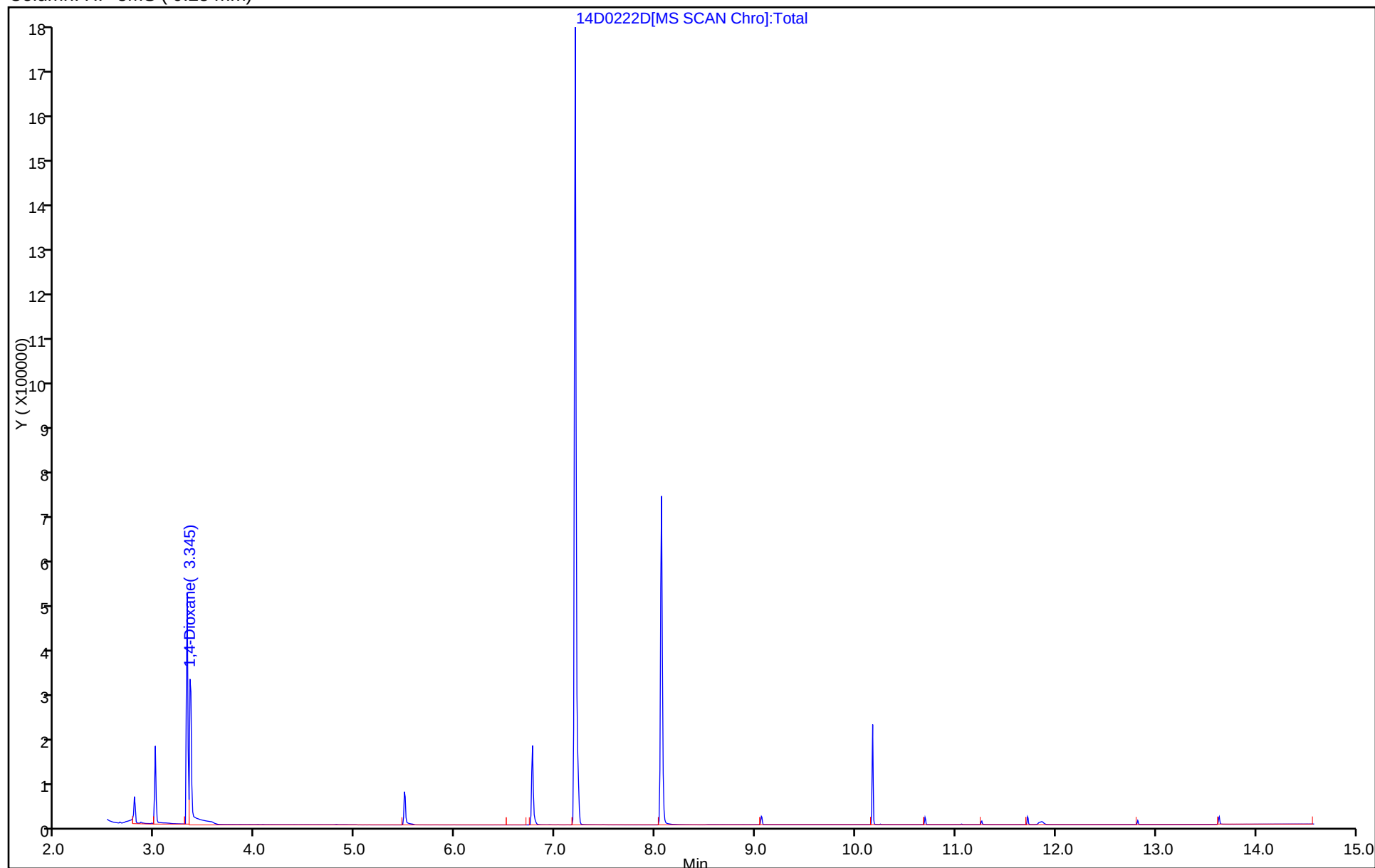
Dil. Factor: 1.0000

ALS Bottle#: 4

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222D.D

Injection Date: 22-Feb-2017 10:41:30

Instrument ID: SV1

Lims ID: IC CS-4

Client ID:

Operator ID:

ALS Bottle#:

4

Worklist Smp#: 4

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

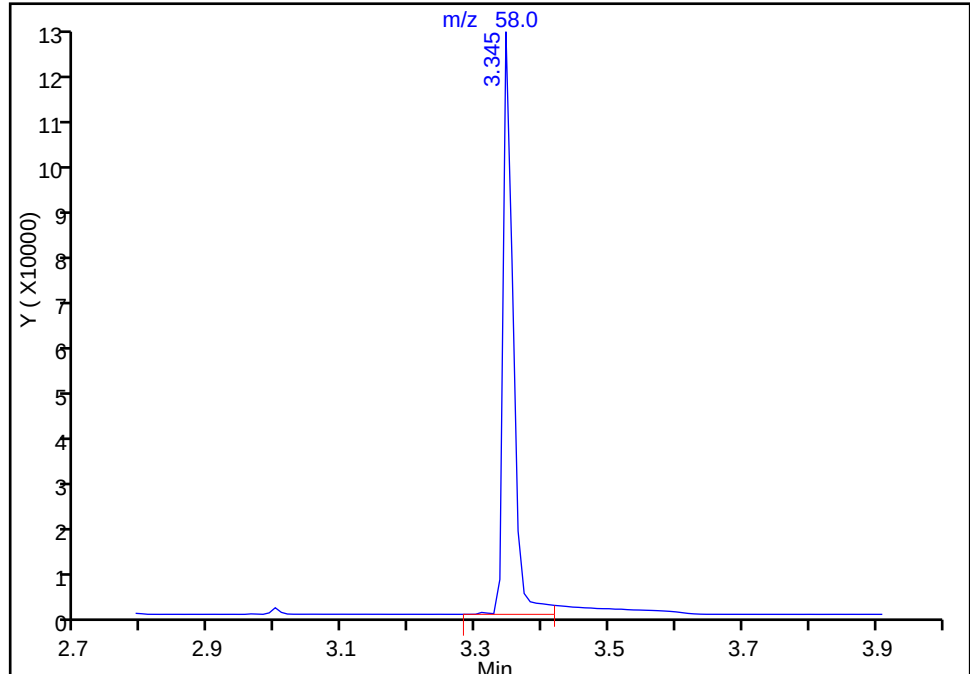
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

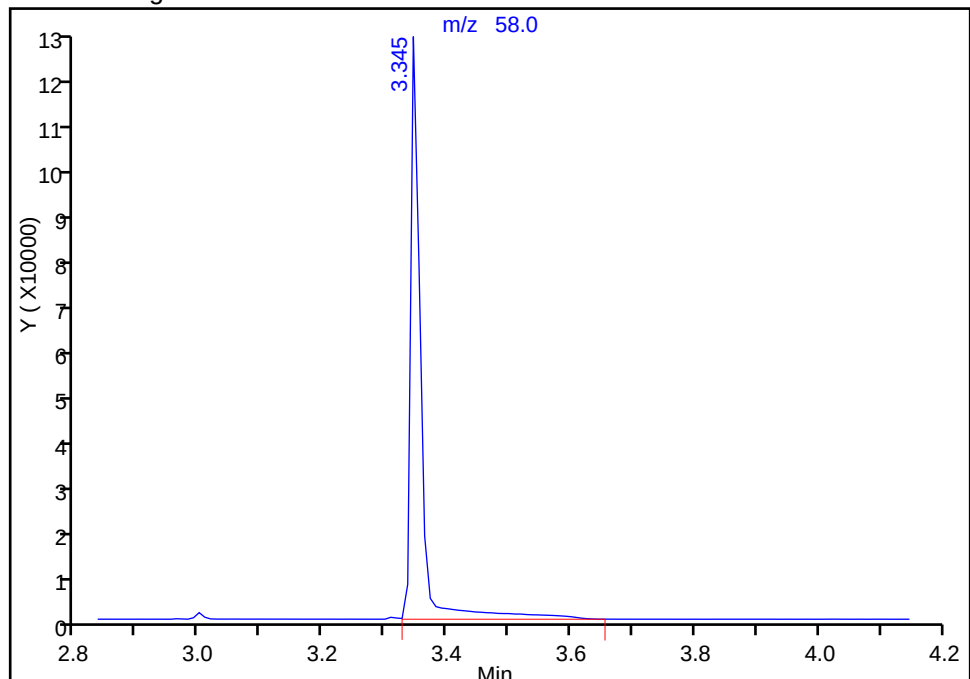
RT: 3.35  
Area: 137931  
Amount: 4.941853  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.35  
Area: 150814  
Amount: 5.484704  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:29

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222E.D  
 Lims ID: ICIS CS-5  
 Client ID:  
 Sample Type: ICIS Calib Level: 5  
 Inject. Date: 22-Feb-2017 11:03:30 ALS Bottle#: 5 Worklist Smp#: 5  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: ICIS CS-5 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:30 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 11:21:43

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | S/N    | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|--------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |        | M     |
| 58                         | 3.354        | 3.354            | 0.000            | 81  | 293131   | 10.0             | 9.29               | 80- 120     | 100   | 145920 | M     |
| 88                         | 3.354        | 3.354            | 0.000            |     | 351365   |                  |                    | 92- 132     | 120   |        |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |        |       |
| 152                        | 7.197        | 7.197            | 0.000            | 100 | 786305   | 10.0             | 10.0               | 80- 120     | 100   |        |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1219926  |                  |                    | 136- 176    | 155   |        |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 448437   |                  |                    | 37.1- 77.1  | 57.0  |        |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |        |       |
| 82                         | 8.059        | 8.059            | 0.000            | 99  | 909372   | 10.0             | 9.58               | 80- 120     | 100   |        |       |
| 128                        | 8.059        | 8.059            | 0.000            |     | 466333   |                  |                    | 29.8- 69.8  | 51.3  |        |       |
| 54                         | 8.051        | 8.059            | -0.008           |     | 534392   |                  |                    | 38.3- 78.3  | 58.8  |        |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL5\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222E.D

Injection Date: 22-Feb-2017 11:03:30

Instrument ID: SV1

Operator ID:

Lims ID: ICIS CS-5

Worklist Smp#: 5

Client ID:

Injection Vol: 1.0 ul

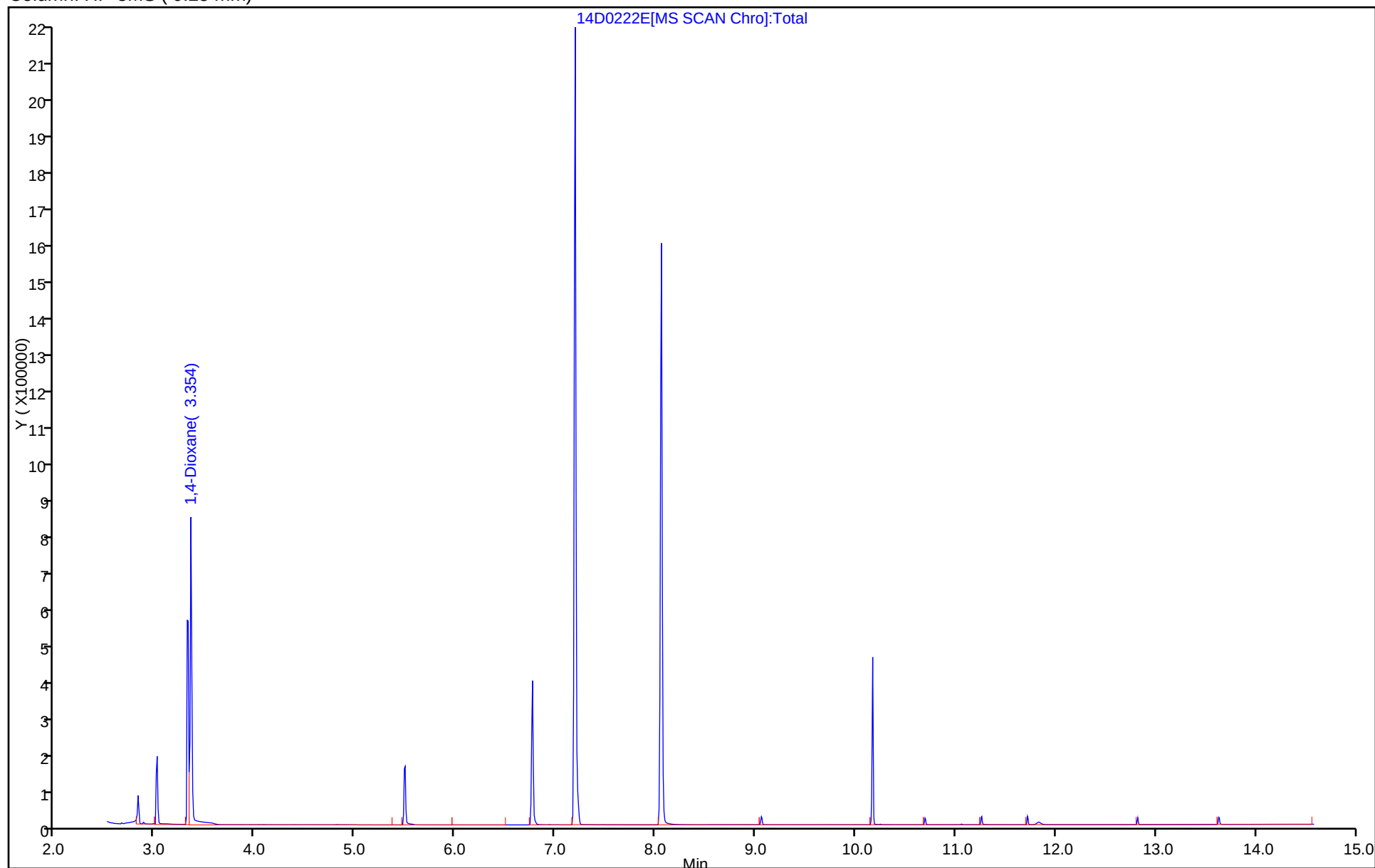
Dil. Factor: 1.0000

ALS Bottle#: 5

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)





## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222E.D

Injection Date: 22-Feb-2017 11:03:30

Instrument ID: SV1

Lims ID: ICIS CS-5

Client ID:

Operator ID:

ALS Bottle#:

5

Worklist Smp#: 5

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

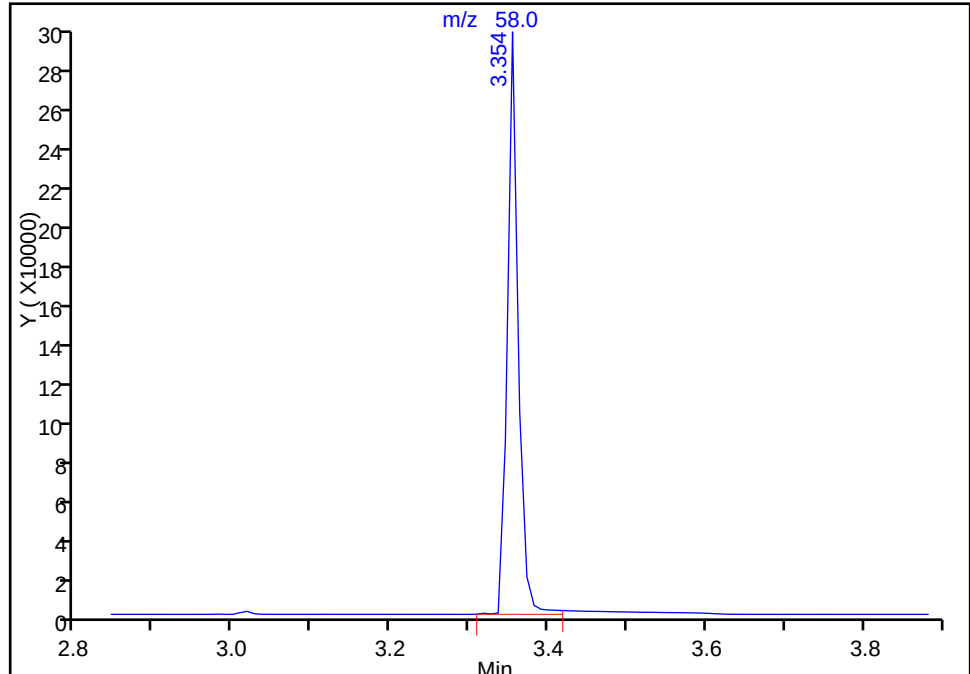
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

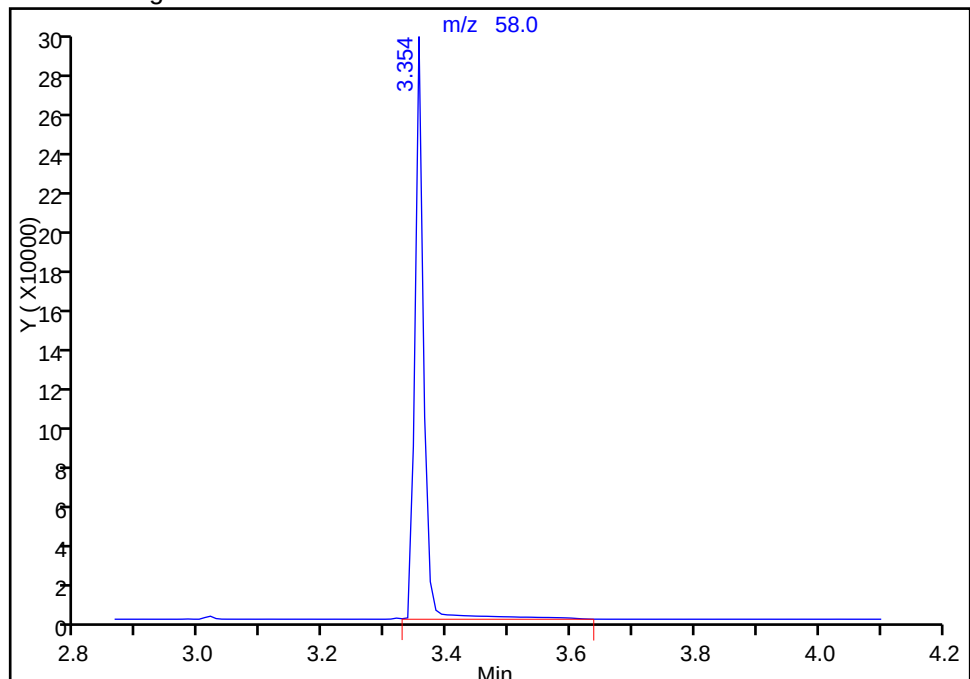
RT: 3.35  
Area: 280244  
Amount: 8.808838  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.35  
Area: 293131  
Amount: 9.291648  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:30

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222F.D  
 Lims ID: IC CS-6  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 22-Feb-2017 11:25:30 ALS Bottle#: 6 Worklist Smp#: 6  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-6 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:31 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 11:46:54

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.355        | 3.354            | 0.001            | 100 | 570238   | 20.0             | 19.5               | 80- 120     | 100   | M     |
| 88                         | 3.364        | 3.354            | 0.010            |     | 655548   |                  |                    | 92- 132     | 115   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.197        | 7.197            | 0.000            | 100 | 729888   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.197        | 7.197            | 0.000            |     | 1138534  |                  |                    | 136- 176    | 156   |       |
| 115                        | 7.197        | 7.197            | 0.000            |     | 417127   |                  |                    | 37.1- 77.1  | 57.1  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.059        | 8.059            | 0.000            | 96  | 1769342  | 20.0             | 20.1               | 80- 120     | 100   |       |
| 128                        | 8.068        | 8.059            | 0.009            |     | 911496   |                  |                    | 29.8- 69.8  | 51.5  |       |
| 54                         | 8.059        | 8.059            | 0.000            |     | 1041598  |                  |                    | 38.3- 78.3  | 58.9  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL6\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222F.D

Injection Date: 22-Feb-2017 11:25:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-6

Worklist Smp#: 6

Client ID:

Injection Vol: 1.0 ul

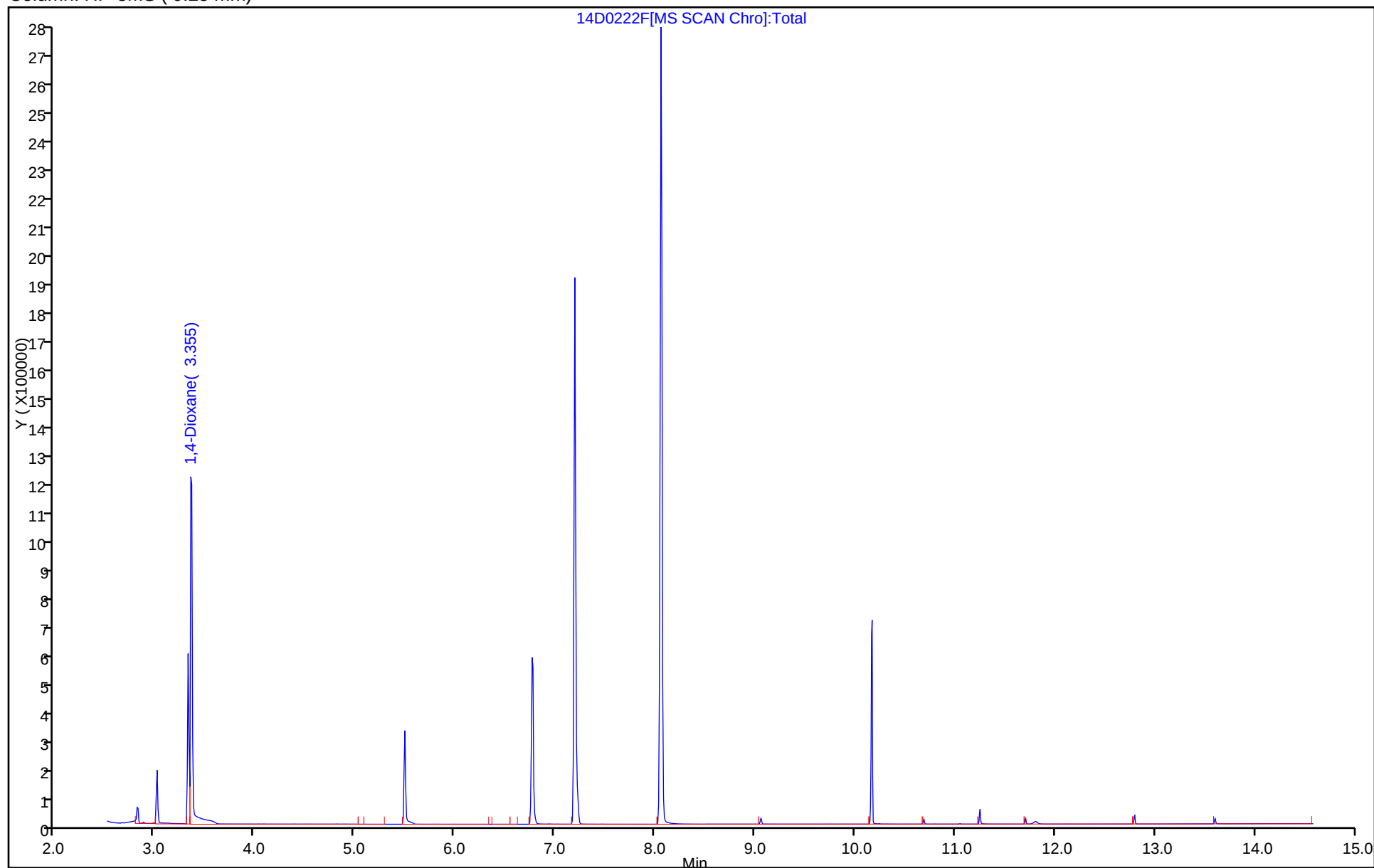
Dil. Factor: 1.0000

ALS Bottle#: 6

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222F.D

Injection Date: 22-Feb-2017 11:25:30

Instrument ID: SV1

Lims ID: IC CS-6

Client ID:

Operator ID:

ALS Bottle#:

6

Worklist Smp#: 6

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

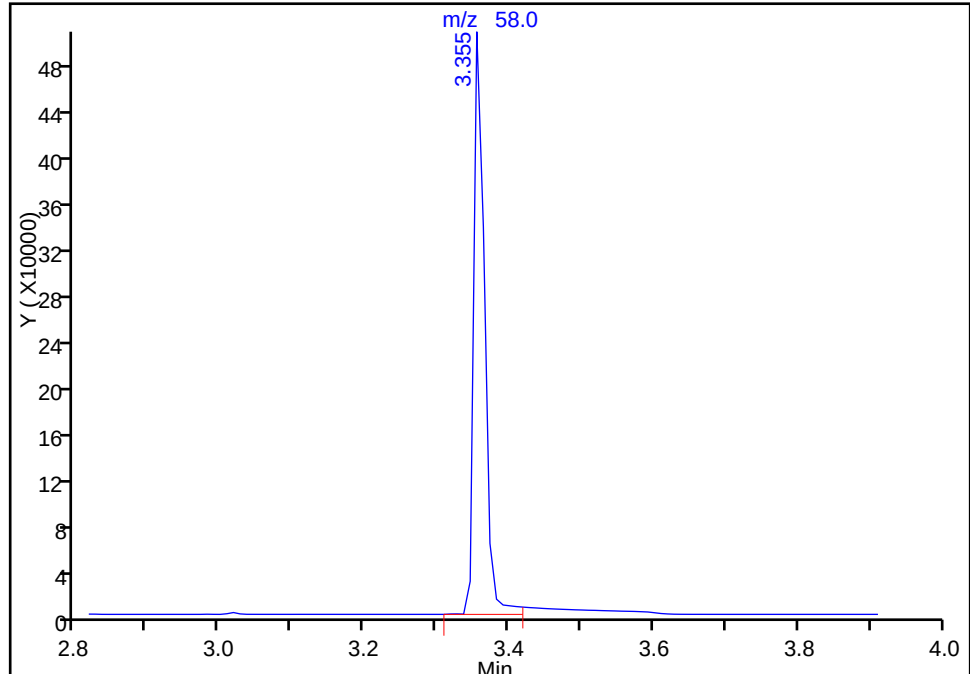
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

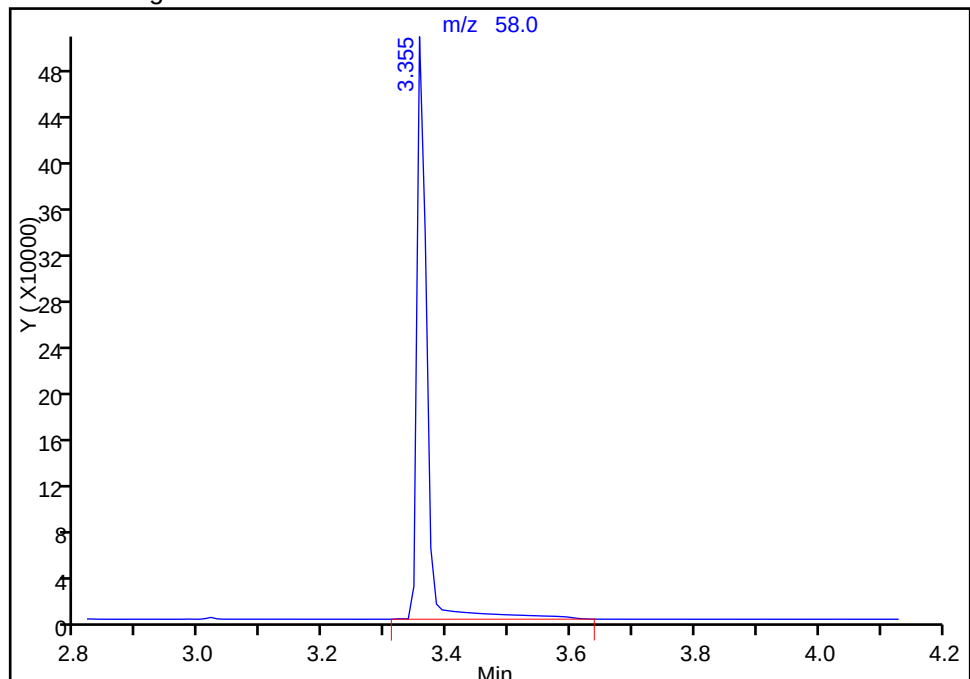
RT: 3.36  
Area: 530709  
Amount: 18.155454  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.36  
Area: 570238  
Amount: 19.472510  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:30

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222G.D  
 Lims ID: IC CS-7  
 Client ID:  
 Sample Type: IC Calib Level: 7  
 Inject. Date: 22-Feb-2017 11:47:30 ALS Bottle#: 7 Worklist Smp#: 7  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-7 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:31 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 12:18:18

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.355        | 3.354            | 0.001            | 90  | 1391248  | 50.0             | 53.4               | 80- 120     | 100   | M     |
| 88                         | 3.364        | 3.354            | 0.010            |     | 1577040  |                  |                    | 92- 132     | 113   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.198        | 7.197            | 0.001            | 100 | 649782   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.198        | 7.197            | 0.001            |     | 1006292  |                  |                    | 136- 176    | 155   |       |
| 115                        | 7.198        | 7.197            | 0.001            |     | 370252   |                  |                    | 37.1- 77.1  | 57.0  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.068        | 8.059            | 0.009            | 97  | 4451578  | 50.0             | 56.7               | 80- 120     | 100   |       |
| 128                        | 8.068        | 8.059            | 0.009            |     | 2303805  |                  |                    | 29.8- 69.8  | 51.8  |       |
| 54                         | 8.068        | 8.059            | 0.009            |     | 2601883  |                  |                    | 38.3- 78.3  | 58.4  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL7\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222G.D

Injection Date: 22-Feb-2017 11:47:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-7

Worklist Smp#: 7

Client ID:

Injection Vol: 1.0 ul

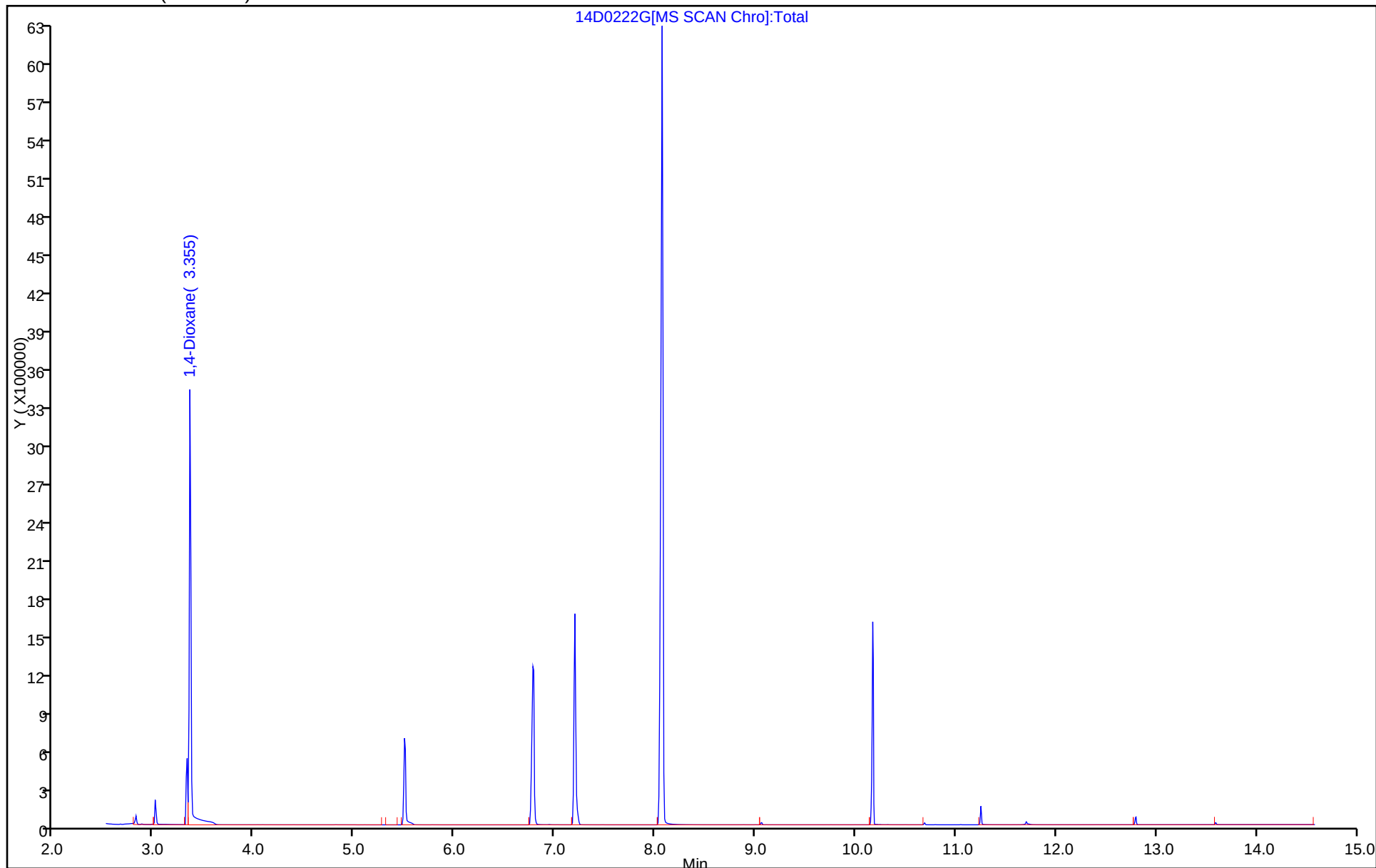
Dil. Factor: 1.0000

ALS Bottle#: 7

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222G.D

Injection Date: 22-Feb-2017 11:47:30

Instrument ID: SV1

Lims ID: IC CS-7

Client ID:

Operator ID:

ALS Bottle#:

7

Worklist Smp#: 7

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

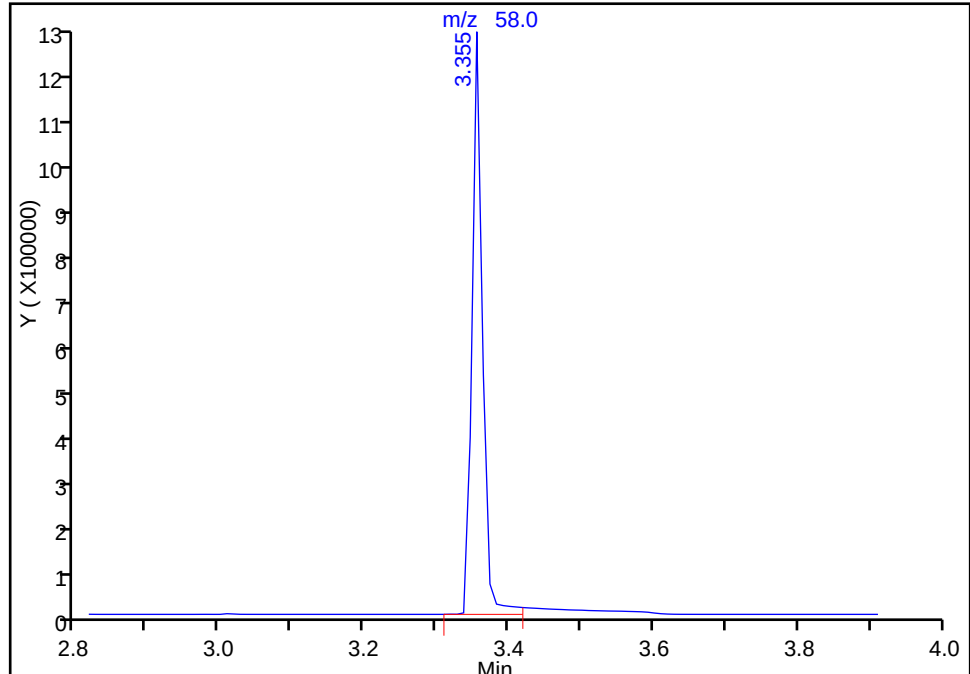
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

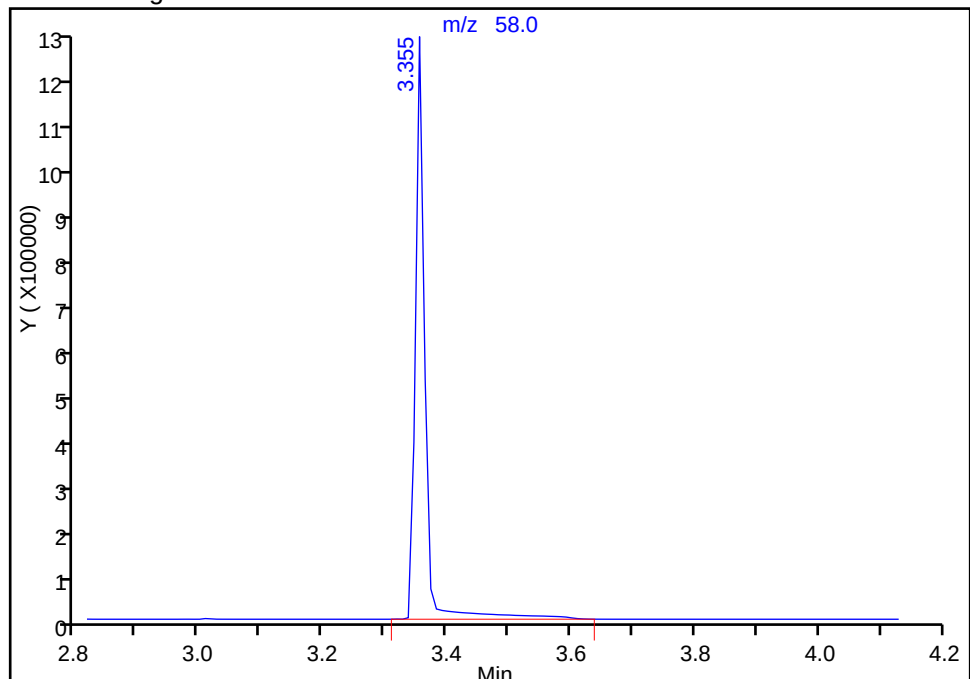
RT: 3.36  
Area: 1295874  
Amount: 49.348837  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.36  
Area: 1391248  
Amount: 53.365292  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:31

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Lims ID: IC CS-8  
 Client ID:  
 Sample Type: IC Calib Level: 8  
 Inject. Date: 22-Feb-2017 12:09:30 ALS Bottle#: 8 Worklist Smp#: 8  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: IC CS-8 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:32 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

First Level Reviewer: onishim

Date: 22-Feb-2017 12:42:13

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q  | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |    |          |                  |                    |             |       |       |
| 58                         | 3.365        | 3.354            | 0.011            | 73 | 2749219  | 100.0            | 87.6               | 80- 120     | 100   | M     |
| 88                         | 3.365        | 3.354            | 0.011            |    | 3047664  |                  |                    | 92- 132     | 111   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |    |          |                  |                    |             |       |       |
| 152                        | 7.198        | 7.197            | 0.001            | 99 | 782185   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.198        | 7.197            | 0.001            |    | 1219969  |                  |                    | 136- 176    | 156   |       |
| 115                        | 7.198        | 7.197            | 0.001            |    | 445630   |                  |                    | 37.1- 77.1  | 57.0  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |    |          |                  |                    |             |       |       |
| 82                         | 8.085        | 8.059            | 0.026            | 98 | 8721763  | 100.0            | 92.3               | 80- 120     | 100   |       |
| 128                        | 8.085        | 8.059            | 0.026            |    | 4541021  |                  |                    | 29.8- 69.8  | 52.1  |       |
| 54                         | 8.077        | 8.059            | 0.018            |    | 5217430  |                  |                    | 38.3- 78.3  | 59.8  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL8\_00005

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D

Injection Date: 22-Feb-2017 12:09:30

Instrument ID: SV1

Operator ID:

Lims ID: IC CS-8

Worklist Smp#: 8

Client ID:

Injection Vol: 1.0 ul

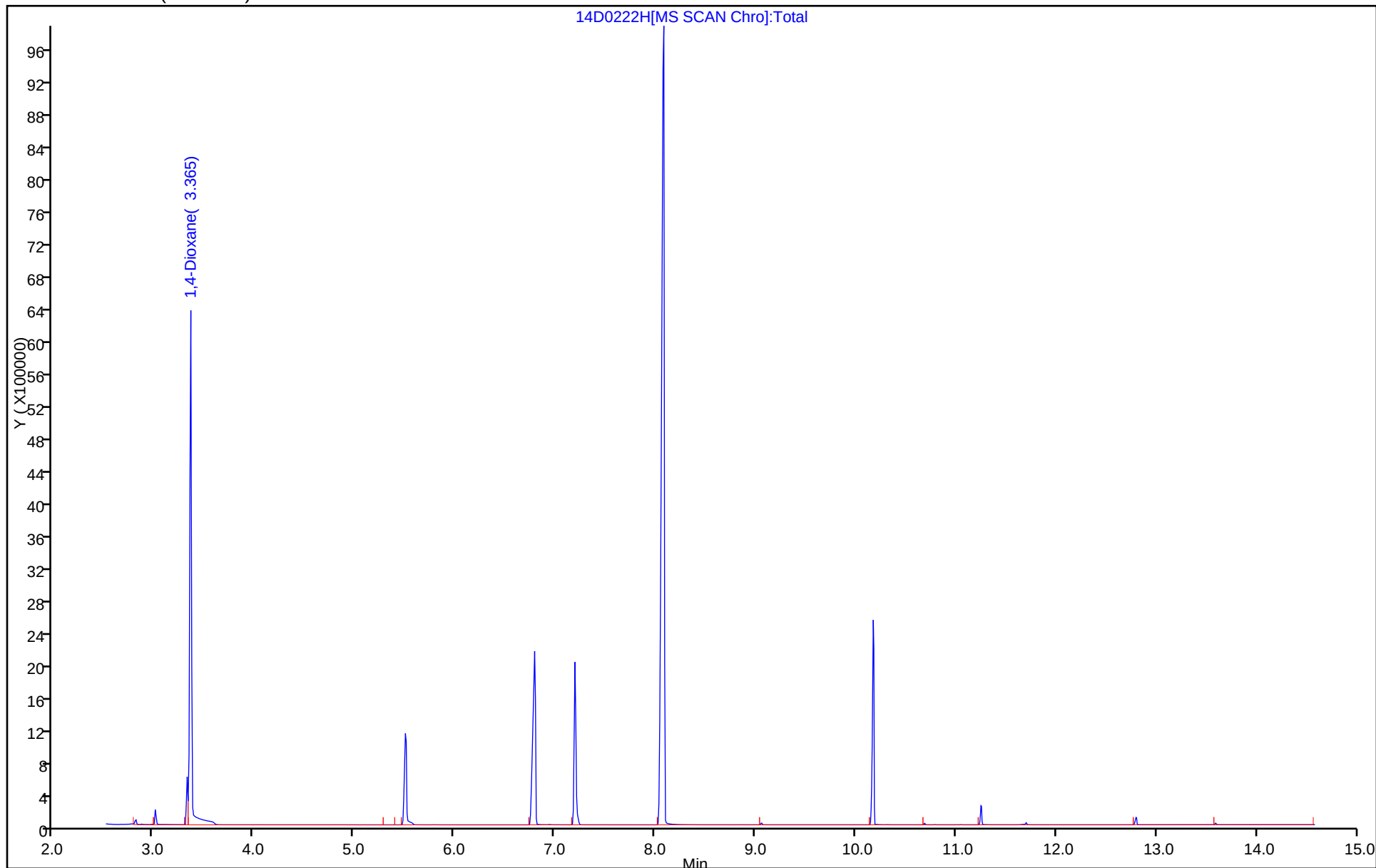
Dil. Factor: 1.0000

ALS Bottle#: 8

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS (0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D

Injection Date: 22-Feb-2017 12:09:30

Instrument ID: SV1

Lims ID: IC CS-8

Client ID:

Operator ID:

ALS Bottle#:

8

Worklist Smp#: 8

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

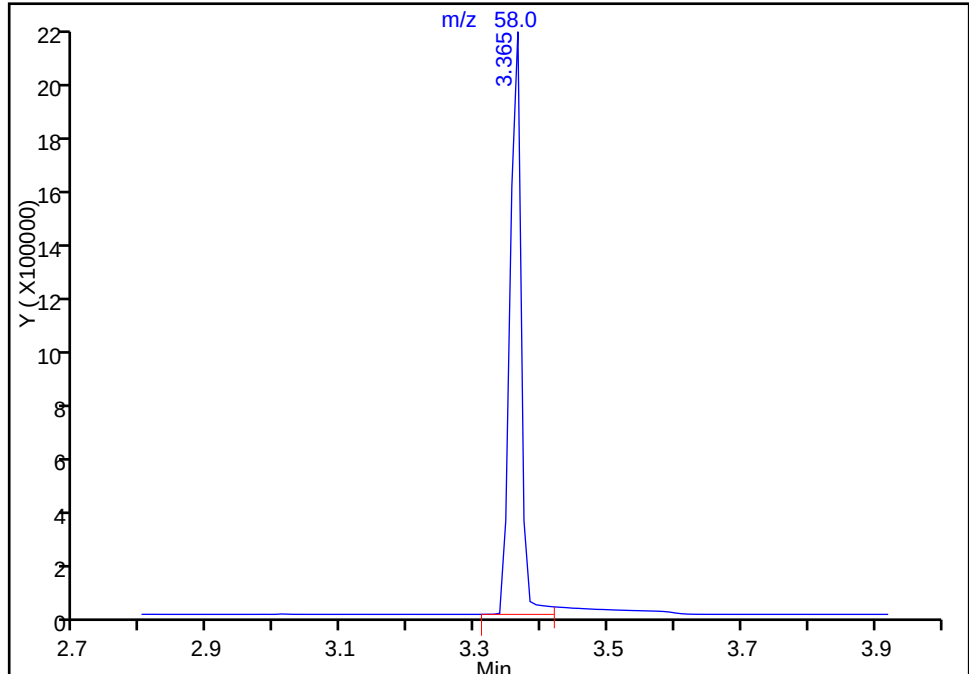
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

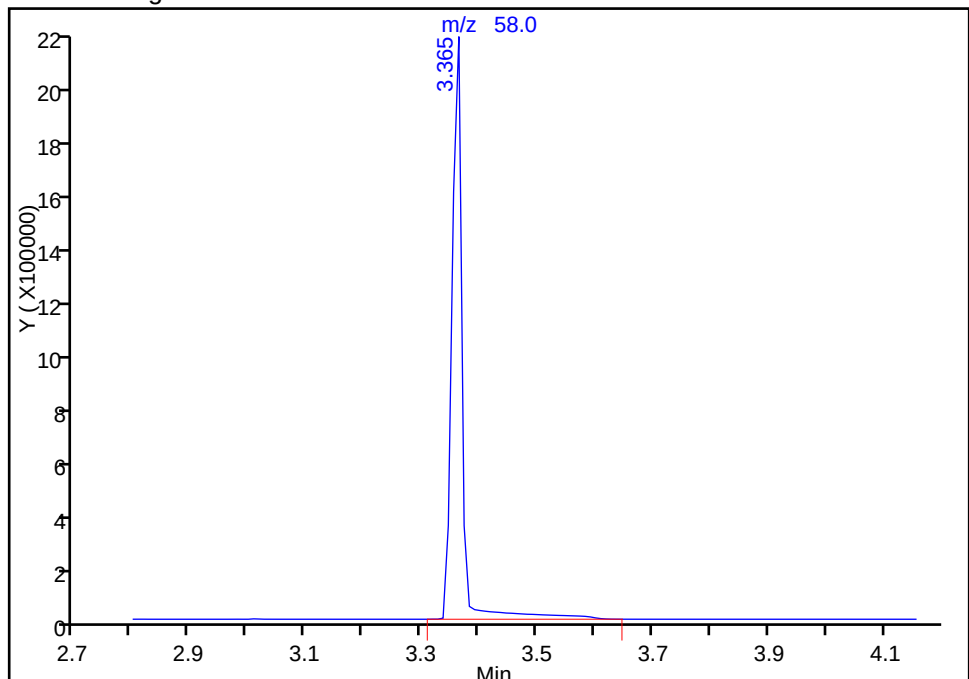
RT: 3.36  
Area: 2566879  
Amount: 82.391732  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.36  
Area: 2749219  
Amount: 87.603583  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 22-Feb-2017 14:19:32

Audit Action: Manually Integrated

Audit Reason: Poor chromatography

FORM VII  
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Lab Sample ID: ICV 320-151686/9 Calibration Date: 02/22/2017 12:31  
Instrument ID: SV1 Calib Start Date: 02/22/2017 09:35  
GC Column: HP-5MS ID: 0.25 (mm) Calib End Date: 02/22/2017 12:09  
Lab File ID: 14D0222.D Conc. Units: ug/mL

| ANALYTE         | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|-----------------|---------------|---------|--------|---------|----------------|-----------------|-------|-----------|
| 1,4-Dioxane     | Ave           | 0.4012  | 0.3365 |         | 8.39           | 10.0            | -16.1 | 30.0      |
| Nitrobenzene-d5 | Ave           | 1.208   | 1.092  |         | 9.04           | 10.0            | -9.6  |           |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222.D  
 Lims ID: ICV  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 22-Feb-2017 12:31:30 ALS Bottle#: 9 Worklist Smp#: 9  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV 14D  
 Operator ID: Instrument ID: SV1  
 Sublist:

Method: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 22-Feb-2017 14:19:32 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D

Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK015

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | S/N  | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |      |       |
| 58                         | 3.371        | 3.354            | 0.017            | 62  | 295999   | 10.0             | 8.39               | 80- 120     | 100   | 1939 |       |
| 88                         | 3.371        | 3.354            | 0.017            |     | 362512   |                  |                    | 92- 132     | 122   |      |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |      |       |
| 152                        | 7.198        | 7.197            | 0.001            | 100 | 879747   | 10.0             | 10.0               | 80- 120     | 100   |      |       |
| 150                        | 7.198        | 7.197            | 0.001            |     | 1372333  |                  |                    | 136- 176    | 156   |      |       |
| 115                        | 7.198        | 7.197            | 0.001            |     | 505357   |                  |                    | 37.1- 77.1  | 57.4  |      |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |      |       |
| 82                         | 8.060        | 8.059            | 0.001            | 99  | 960674   | 10.0             | 9.04               | 80- 120     | 100   |      |       |
| 128                        | 8.060        | 8.059            | 0.001            |     | 494326   |                  |                    | 29.8- 69.8  | 51.5  |      |       |
| 54                         | 8.052        | 8.059            | -0.007           |     | 562315   |                  |                    | 38.3- 78.3  | 58.5  |      |       |

## Reagents:

MS14DICV\_00004

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222.D

Injection Date: 22-Feb-2017 12:31:30

Instrument ID: SV1

Operator ID:

Lims ID: ICV

Worklist Smp#: 9

Client ID:

Injection Vol: 1.0 ul

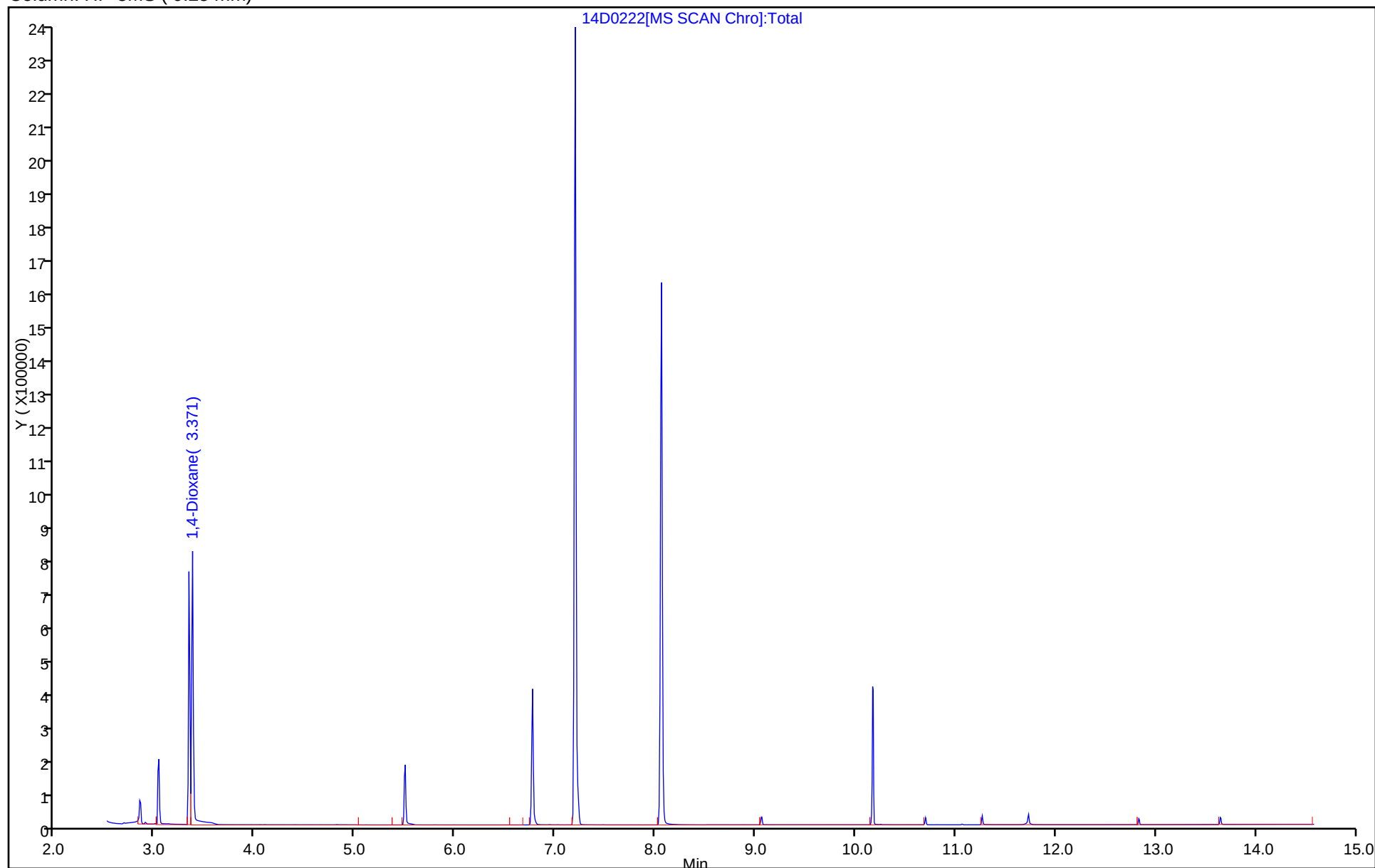
Dil. Factor: 1.0000

ALS Bottle#: 9

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



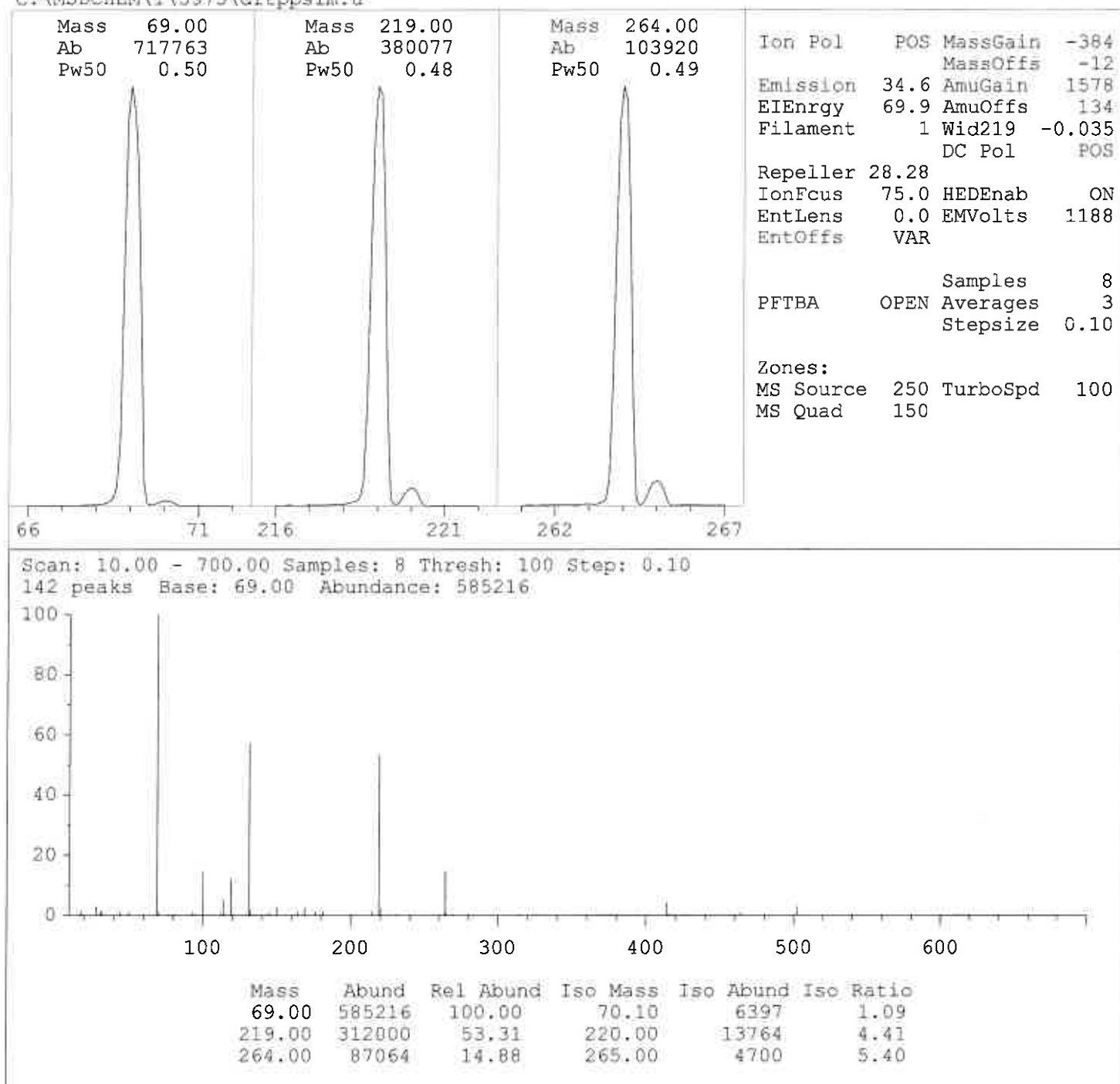
FORM VII  
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Lab Sample ID: CCV 320-154875/2 Calibration Date: 03/14/2017 14:42  
Instrument ID: SV1 Calib Start Date: 02/22/2017 09:35  
GC Column: HP-5MS ID: 0.25 (mm) Calib End Date: 02/22/2017 12:09  
Lab File ID: 14D0314.D Conc. Units: ug/mL

| ANALYTE         | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| 1,4-Dioxane     | Ave           | 0.4012  | 0.3923 |         | 9.78           | 10.0            | -2.2 | 30.0      |
| Nitrobenzene-d5 | Ave           | 1.208   | 1.204  |         | 9.97           | 10.0            | -0.3 | 30.0      |

Tue Mar 14 14:14:56 2017  
C:\MSDCHEM\1\5973\dftppsims.u

Instrument: SV1



Air/Water Check: H2O~1.49% N2~2.83% O2~0.93% CO2~0.99% N2/H2O~190.25%

Column Flow: Front: 1.4 Back: 0 ml/min. Interface Temp: 250

#### Ramp Criteria:

Ion Focus Maximum 90 volts using ion 264; EM Gain 206251  
Repeller Maximum 35 volts using ion 219;

MassGain Values @Samples: -384@3 -384@2 -384@1 -384@0 -384@FS

| TARGET MASS:          | 50    | 69    | 131   | 219   | 414   | 502   | 800   |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Amu Offset:           | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 | 134.0 |
| Entrance Lens Offset: | 14.6  | 12.0  | 13.3  | 12.5  | 13.8  | 12.8  | 12.8  |
| Target Abund(%)       | 1.0   | 100.0 | 55.0  | 45.0  | 3.0   | 2.0   |       |
| Actual Tune Abund(%)  | 0.9   | 100.0 | 57.1  | 53.3  | 4.3   | 3.0   |       |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314.D  
 Lims ID: CCV  
 Client ID:  
 Sample Type: CCV  
 Inject. Date: 14-Mar-2017 14:42:30 ALS Bottle#: 96 Worklist Smp#: 2  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 14:26:50 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK013

First Level Reviewer: onishim

Date: 14-Mar-2017 15:23:26

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q  | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | S/N    | Flags |
|----------------------------|--------------|------------------|------------------|----|----------|------------------|--------------------|-------------|-------|--------|-------|
| 1 1,4-Dioxane              |              |                  |                  |    |          |                  |                    |             |       |        | M     |
| 58                         | 3.320        | 3.320            | 0.000            | 91 | 267975   | 10.0             | 9.78               | 80- 120     | 100   | 118656 | M     |
| 88                         | 3.329        | 3.320            | 0.009            |    | 295886   |                  |                    | 90- 130     | 110   |        |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |    |          |                  |                    |             |       |        |       |
| 152                        | 7.172        | 7.172            | 0.000            | 97 | 683060   | 10.0             | 10.0               | 80- 120     | 100   |        |       |
| 150                        | 7.172        | 7.172            | 0.000            |    | 1056782  |                  |                    | 135- 175    | 155   |        |       |
| 115                        | 7.172        | 7.172            | 0.000            |    | 381437   |                  |                    | 35.8- 75.8  | 55.8  |        |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |    |          |                  |                    |             |       |        |       |
| 82                         | 8.035        | 8.035            | 0.000            | 96 | 822559   | 10.0             | 9.97               | 80- 120     | 100   |        |       |
| 128                        | 8.035        | 8.035            | 0.000            |    | 442211   |                  |                    | 33.8- 73.8  | 53.8  |        |       |
| 54                         | 8.035        | 8.035            | 0.000            |    | 472906   |                  |                    | 37.5- 77.5  | 57.5  |        |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL5\_00010

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314.D

Injection Date: 14-Mar-2017 14:42:30

Instrument ID: SV1

Operator ID:

Lims ID: CCV

Worklist Smp#: 2

Client ID:

Injection Vol: 1.0 ul

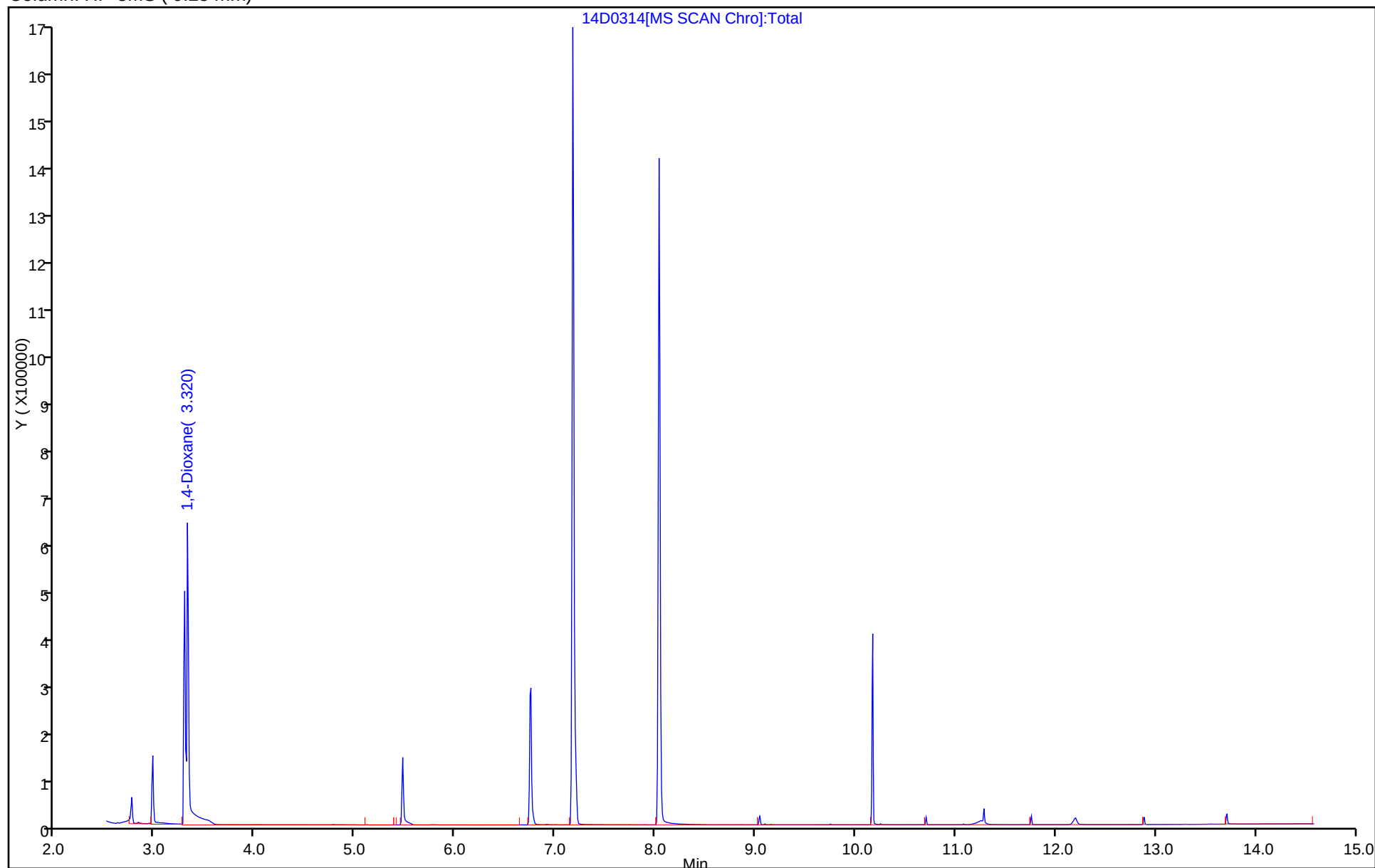
Dil. Factor: 1.0000

ALS Bottle#: 96

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314.D

Injection Date: 14-Mar-2017 14:42:30

Instrument ID: SV1

Lims ID: CCV

Client ID:

Operator ID:

ALS Bottle#:

96

Worklist Smp#: 2

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

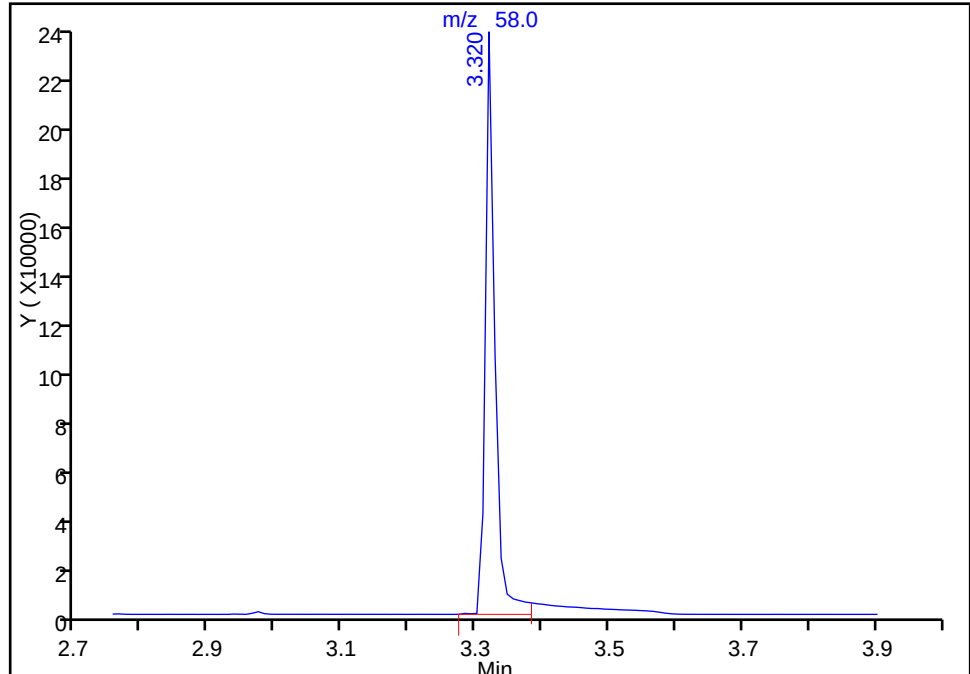
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

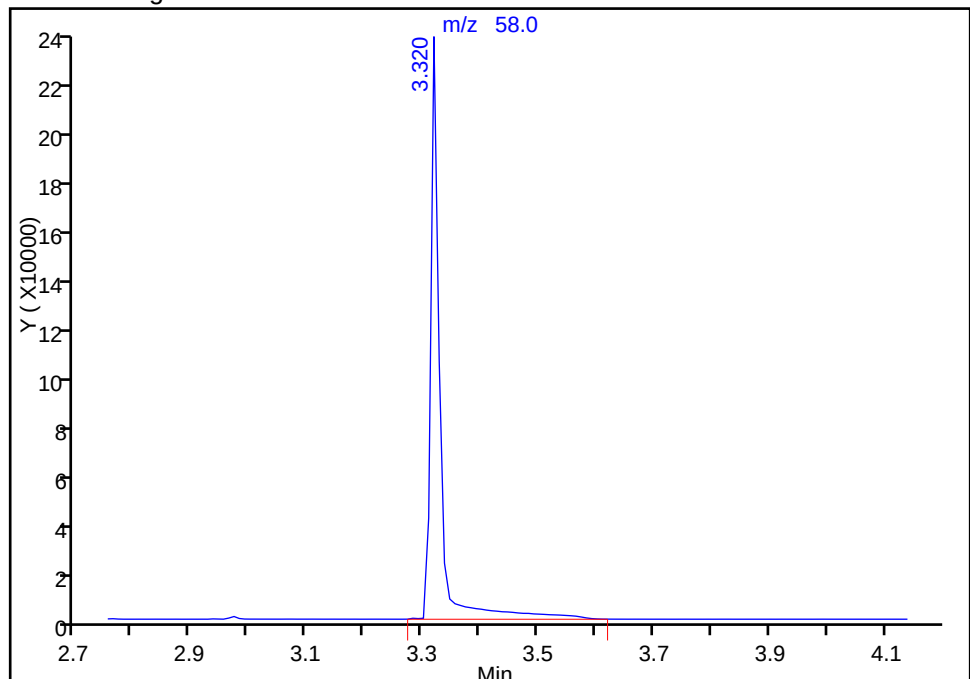
RT: 3.32  
Area: 238941  
Amount: 8.718742  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.32  
Area: 267975  
Amount: 9.778167  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 15-Mar-2017 14:26:39

Audit Action: Manually Integrated

Audit Reason: Peak Tail

FORM VII  
GC/MS SEMI VOA CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Lab Sample ID: CCVC 320-154875/29 Calibration Date: 03/15/2017 00:49  
Instrument ID: SV1 Calib Start Date: 02/22/2017 09:35  
GC Column: HP-5MS ID: 0.25 (mm) Calib End Date: 02/22/2017 12:09  
Lab File ID: 14D0314A.D Conc. Units: ug/mL

| ANALYTE         | CURVE<br>TYPE | AVE RRF | RRF    | MIN RRF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|-----------------|---------------|---------|--------|---------|----------------|-----------------|------|-----------|
| 1,4-Dioxane     | Ave           | 0.4012  | 0.3975 |         | 9.91           | 10.0            | -0.9 | 50.0      |
| Nitrobenzene-d5 | Ave           | 1.208   | 1.204  |         | 9.97           | 10.0            | -0.3 | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314A.D  
 Lims ID: CCVC  
 Client ID:  
 Sample Type: CCVC  
 Inject. Date: 15-Mar-2017 00:49:30 ALS Bottle#: 96 Worklist Smp#: 29  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: CCVC 14D  
 Operator ID: Instrument ID: SV1  
 Sublist: chrom-1,4-Dioxane\*sub8  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 08:36:53 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK031

First Level Reviewer: chajita

Date: 15-Mar-2017 15:13:17

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | S/N   | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 58                         | 3.319        | 3.319            | 0.000            | 78  | 269963   | 10.0             | 9.91               | 80- 120     | 100   | 66474 | M     |
| 88                         | 3.319        | 3.319            | 0.000            |     | 290765   |                  |                    | 88- 128     | 108   |       |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 152                        | 7.174        | 7.174            | 0.000            | 100 | 679174   | 10.0             | 10.0               | 80- 120     | 100   |       |       |
| 150                        | 7.174        | 7.174            | 0.000            |     | 1055158  |                  |                    | 135- 175    | 155   |       |       |
| 115                        | 7.174        | 7.174            | 0.000            |     | 381694   |                  |                    | 36.2- 76.2  | 56.2  |       |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |       |
| 82                         | 8.036        | 8.036            | 0.000            | 99  | 817415   | 10.0             | 9.97               | 80- 120     | 100   |       |       |
| 128                        | 8.036        | 8.036            | 0.000            |     | 440948   |                  |                    | 33.9- 73.9  | 53.9  |       |       |
| 54                         | 8.036        | 8.036            | 0.000            |     | 465051   |                  |                    | 36.9- 76.9  | 56.9  |       |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS14DL5\_00010

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314A.D

Injection Date: 15-Mar-2017 00:49:30

Instrument ID: SV1

Operator ID:

Lims ID: CCVC

Worklist Smp#: 29

Client ID:

Injection Vol: 1.0 ul

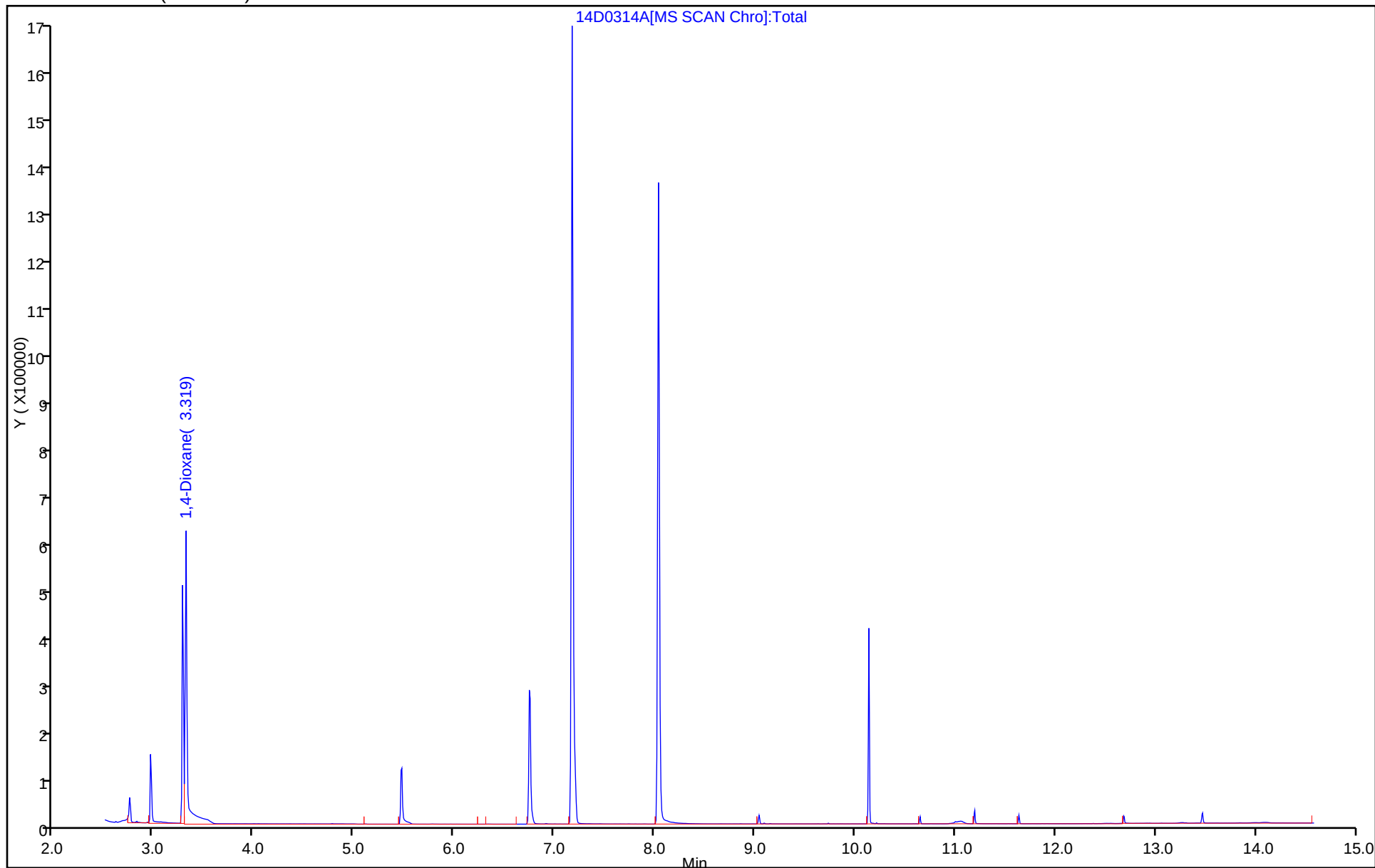
Dil. Factor: 1.0000

ALS Bottle#: 96

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\14D0314A.D

Injection Date: 15-Mar-2017 00:49:30

Instrument ID: SV1

Lims ID: CCVC

Client ID:

Operator ID:

ALS Bottle#:

96

Worklist Smp#: 29

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

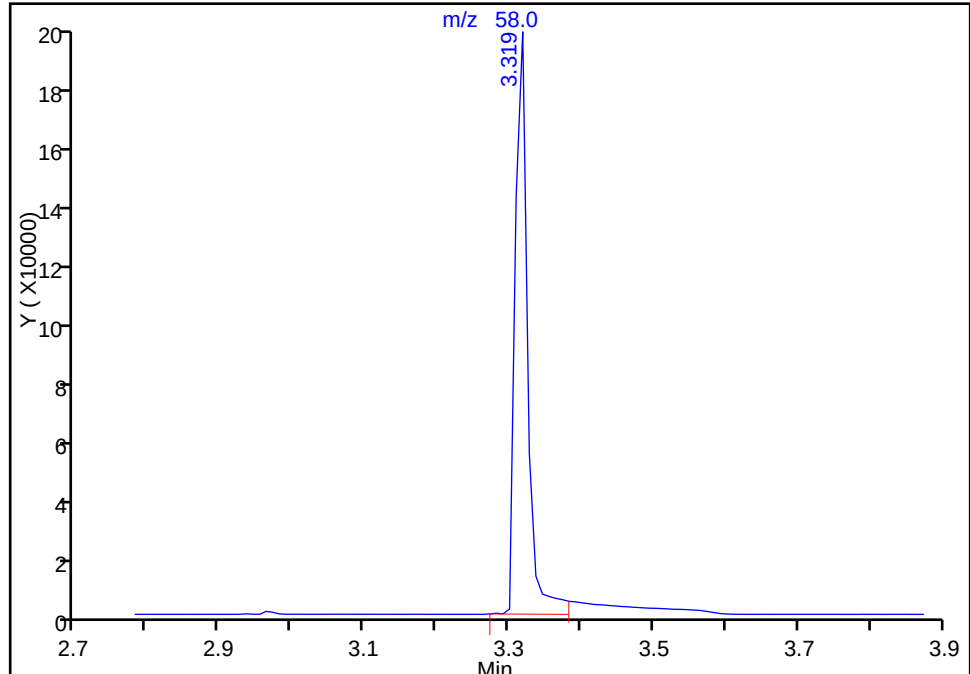
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

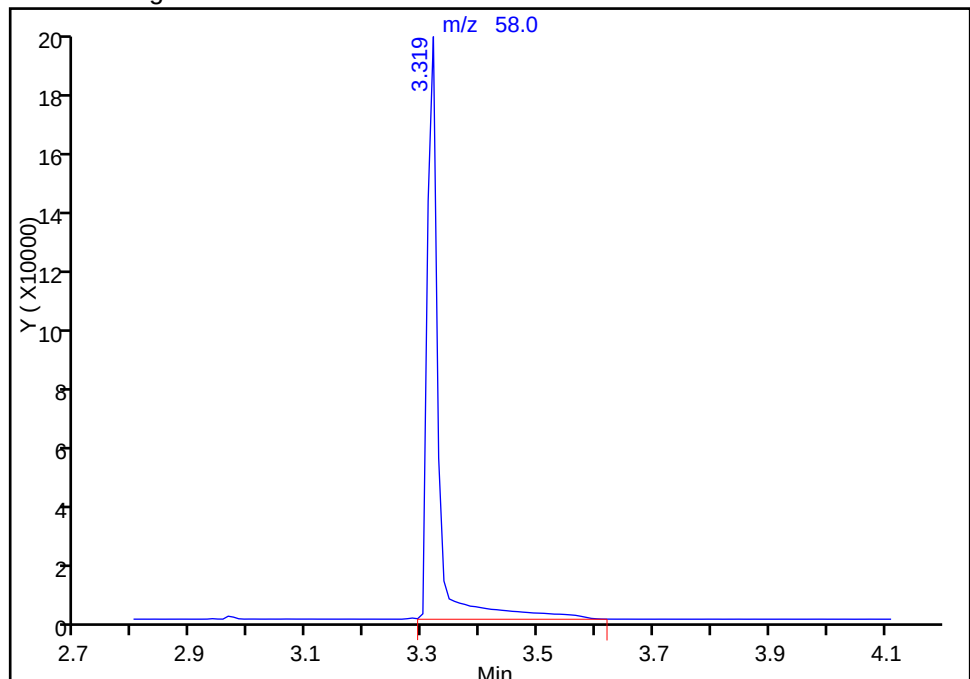
RT: 3.32  
Area: 240662  
Amount: 8.831785  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.32  
Area: 269963  
Amount: 9.907069  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 15-Mar-2017 08:36:50

Audit Action: Manually Integrated

Audit Reason: Peak Tail

FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-153806/1-A  
Matrix: Water Lab File ID: S031416.D  
Analysis Method: WS-MS-0011 Date Collected: \_\_\_\_\_  
Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
Sample wt/vol: 1000 (mL) Date Analyzed: 03/14/2017 20:43  
Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
Injection Volume: 1 (uL) Level: (low/med) Low  
% Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 0.50   | U | 1.0 | 0.50 | 0.20 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 69   |   | 42-91  |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031416.D  
 Lims ID: MB 320-153806/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 14-Mar-2017 20:43:30 ALS Bottle#: 16 Worklist Smp#: 18  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-153806/1-a  
 Operator ID: Instrument ID: SV1  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 14:26:50 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK013

First Level Reviewer: lardieo

Date: 14-Mar-2017 21:29:27

| Sig | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|-----|--------------|------------------|------------------|---|----------|------------------|--------------------|-------------|-------|-------|
|-----|--------------|------------------|------------------|---|----------|------------------|--------------------|-------------|-------|-------|

## 1 1,4-Dioxane

|    |       |  |  |  |  |  |  |  |  |    |
|----|-------|--|--|--|--|--|--|--|--|----|
| 58 | 3.320 |  |  |  |  |  |  |  |  | ND |
| 88 | 3.320 |  |  |  |  |  |  |  |  |    |

## \* 2 1,4-Dichlorobenzene-d4

|     |       |       |       |     |         |      |      |            |      |  |
|-----|-------|-------|-------|-----|---------|------|------|------------|------|--|
| 152 | 7.173 | 7.172 | 0.001 | 100 | 769575  | 10.0 | 10.0 | 80- 120    | 100  |  |
| 150 | 7.173 | 7.172 | 0.001 |     | 1194046 |      |      | 135- 175   | 155  |  |
| 115 | 7.173 | 7.172 | 0.001 |     | 432538  |      |      | 35.8- 75.8 | 56.2 |  |

## \$ 3 Nitrobenzene-d5

|     |       |       |       |    |        |      |      |            |      |  |
|-----|-------|-------|-------|----|--------|------|------|------------|------|--|
| 82  | 8.036 | 8.035 | 0.001 | 99 | 322104 | 5.00 | 3.47 | 80- 120    | 100  |  |
| 128 | 8.036 | 8.035 | 0.001 |    | 171017 |      |      | 33.8- 73.8 | 53.1 |  |
| 54  | 8.036 | 8.035 | 0.001 |    | 183902 |      |      | 37.5- 77.5 | 57.1 |  |

## Reagents:

|                |                    |           |             |
|----------------|--------------------|-----------|-------------|
| MS8270IS_00016 | Amount Added: 5.00 | Units: uL | Run Reagent |
|----------------|--------------------|-----------|-------------|



Report Date: 15-Mar-2017 14:30:11

Chrom Revision: 2.2 13-Mar-2017 15:50:30

TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031416.D

Injection Date: 14-Mar-2017 20:43:30

Instrument ID: SV1

Operator ID:

Lims ID: MB 320-153806/1-A

Worklist Smp#: 18

Client ID:

Injection Vol: 1.0 ul

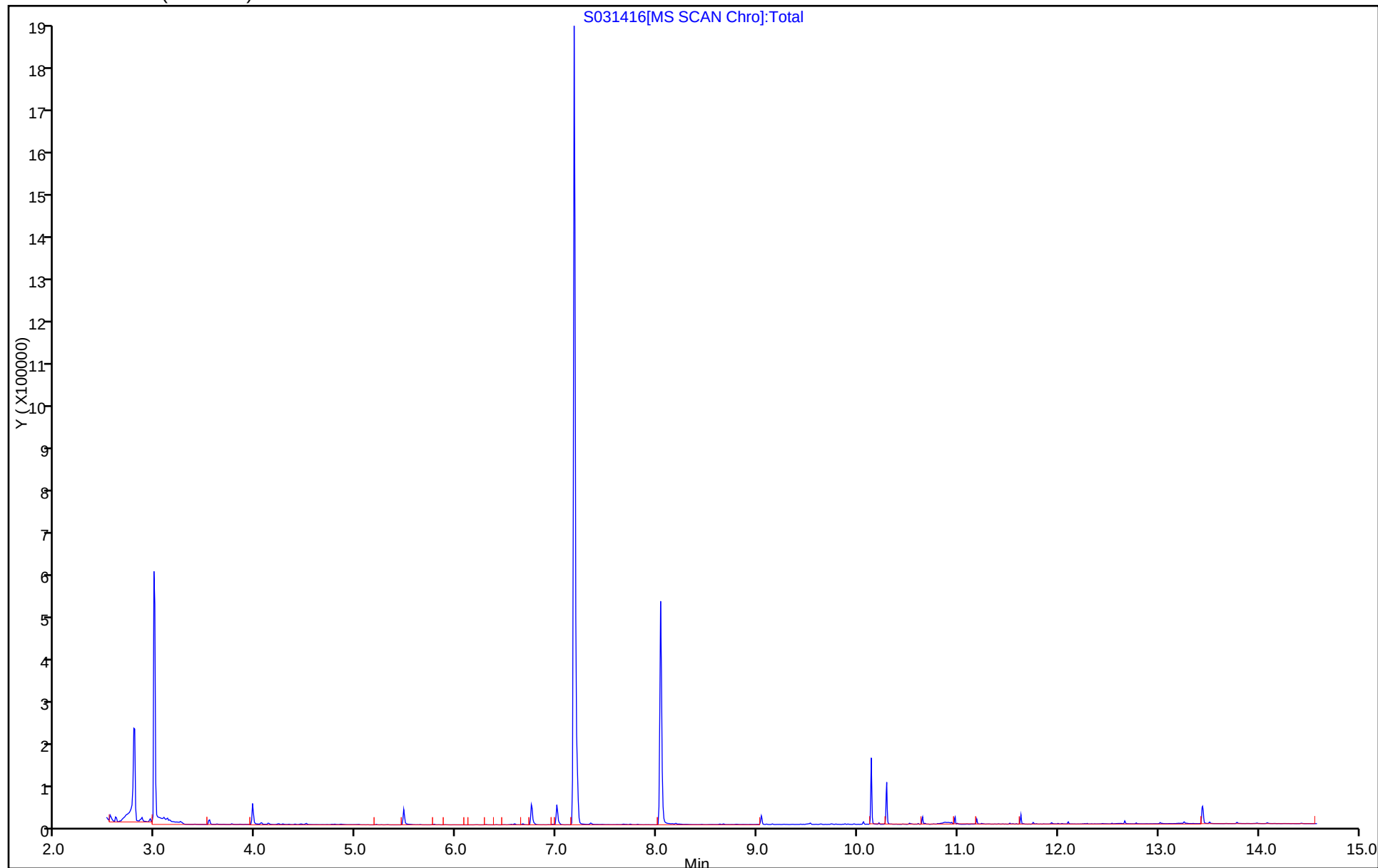
Dil. Factor: 1.0000

ALS Bottle#: 16

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031416.D  
Lims ID: MB 320-153806/1-A  
Client ID:  
Sample Type: MB  
Inject. Date: 14-Mar-2017 20:43:30 ALS Bottle#: 16 Worklist Smp#: 18  
Injection Vol: 1.0 ul Dil. Factor: 1.0000  
Sample Info: mb 320-153806/1-a  
Operator ID: Instrument ID: SV1  
Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
Limit Group: MSS - 8270SIM 14DX - ICAL  
Last Update: 15-Mar-2017 14:26:50 Calib Date: 22-Feb-2017 12:09:30  
Integrator: RTE ID Type: RT Order ID  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
Process Host: XAWRK013

First Level Reviewer: lardieo

Date: 14-Mar-2017 21:29:27

| Compound             | Amount Added | Amount Recovered | % Rec. |
|----------------------|--------------|------------------|--------|
| \$ 3 Nitrobenzene-d5 | 5.00         | 3.47             | 69.31  |

FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-153806/2-A  
Matrix: Water Lab File ID: S031417.D  
Analysis Method: WS-MS-0011 Date Collected: \_\_\_\_\_  
Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
Sample wt/vol: 1000 (mL) Date Analyzed: 03/14/2017 21:06  
Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
Injection Volume: 1 (uL) Level: (low/med) Low  
% Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 3.17   | M | 1.0 | 0.50 | 0.20 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 75   |   | 42-91  |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031417.D  
 Lims ID: LCS 320-153806/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 14-Mar-2017 21:06:30 ALS Bottle#: 17 Worklist Smp#: 19  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-153806/2-a  
 Operator ID: Instrument ID: SV1  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 14:26:50 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK013

First Level Reviewer: lardieo

Date: 14-Mar-2017 21:29:48

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q   | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|-----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |     |          |                  |                    |             |       |       |
| 58                         | 3.320        | 3.320            | 0.000            | 76  | 80541    | 10.0             | 3.17               | 80- 120     | 100   | M     |
| 88                         | 3.320        | 3.320            | 0.000            |     | 86900    |                  |                    | 90- 130     | 108   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |     |          |                  |                    |             |       |       |
| 152                        | 7.173        | 7.172            | 0.001            | 100 | 633634   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.173        | 7.172            | 0.001            |     | 980866   |                  |                    | 135- 175    | 155   |       |
| 115                        | 7.173        | 7.172            | 0.001            |     | 352385   |                  |                    | 35.8- 75.8  | 55.6  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |     |          |                  |                    |             |       |       |
| 82                         | 8.035        | 8.035            | 0.000            | 99  | 285154   | 5.00             | 3.73               | 80- 120     | 100   |       |
| 128                        | 8.043        | 8.035            | 0.008            |     | 150723   |                  |                    | 33.8- 73.8  | 52.9  |       |
| 54                         | 8.035        | 8.035            | 0.000            |     | 162990   |                  |                    | 37.5- 77.5  | 57.2  |       |

## QC Flag Legend

Review Flags

M - Manually Integrated

## Reagents:

MS8270IS\_00016

Amount Added: 5.00

Units: uL

Run Reagent

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031417.D

Injection Date: 14-Mar-2017 21:06:30

Instrument ID: SV1

Operator ID:

Lims ID: LCS 320-153806/2-A

Worklist Smp#: 19

Client ID:

Injection Vol: 1.0 ul

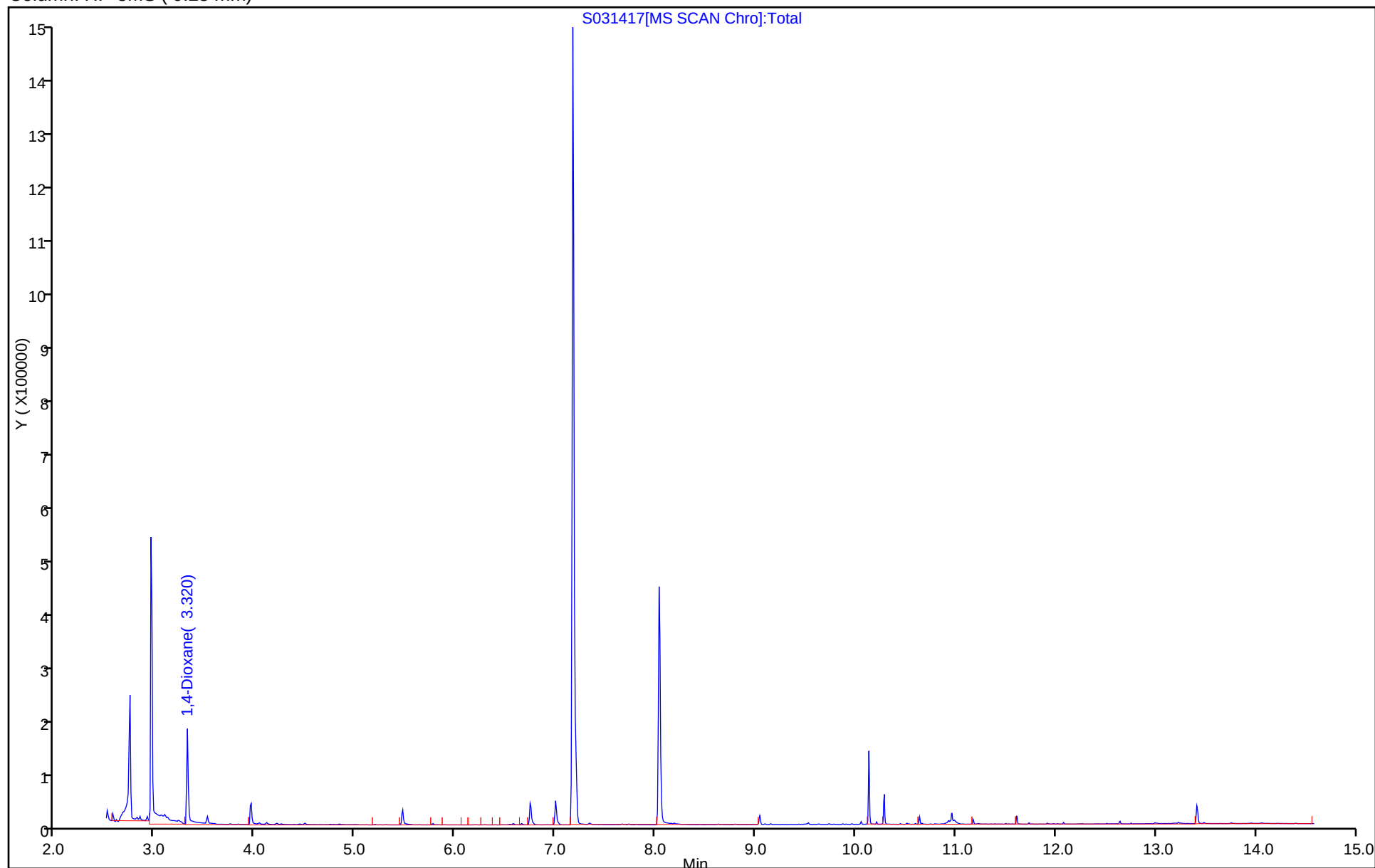
Dil. Factor: 1.0000

ALS Bottle#: 17

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031417.D  
Lims ID: LCS 320-153806/2-A  
Client ID:  
Sample Type: LCS  
Inject. Date: 14-Mar-2017 21:06:30 ALS Bottle#: 17 Worklist Smp#: 19  
Injection Vol: 1.0 ul Dil. Factor: 1.0000  
Sample Info: lcs 320-153806/2-a  
Operator ID: Instrument ID: SV1  
Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
Limit Group: MSS - 8270SIM 14DX - ICAL  
Last Update: 15-Mar-2017 14:26:50 Calib Date: 22-Feb-2017 12:09:30  
Integrator: RTE ID Type: RT Order ID  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
Process Host: XAWRK013

First Level Reviewer: lardieo

Date: 14-Mar-2017 21:29:48

| Compound             | Amount Added | Amount Recovered | % Rec. |
|----------------------|--------------|------------------|--------|
| \$ 3 Nitrobenzene-d5 | 5.00         | 3.73             | 74.53  |

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031417.D

Injection Date: 14-Mar-2017 21:06:30

Instrument ID: SV1

Lims ID: LCS 320-153806/2-A

Client ID:

Operator ID:

ALS Bottle#:

17

Worklist Smp#: 19

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

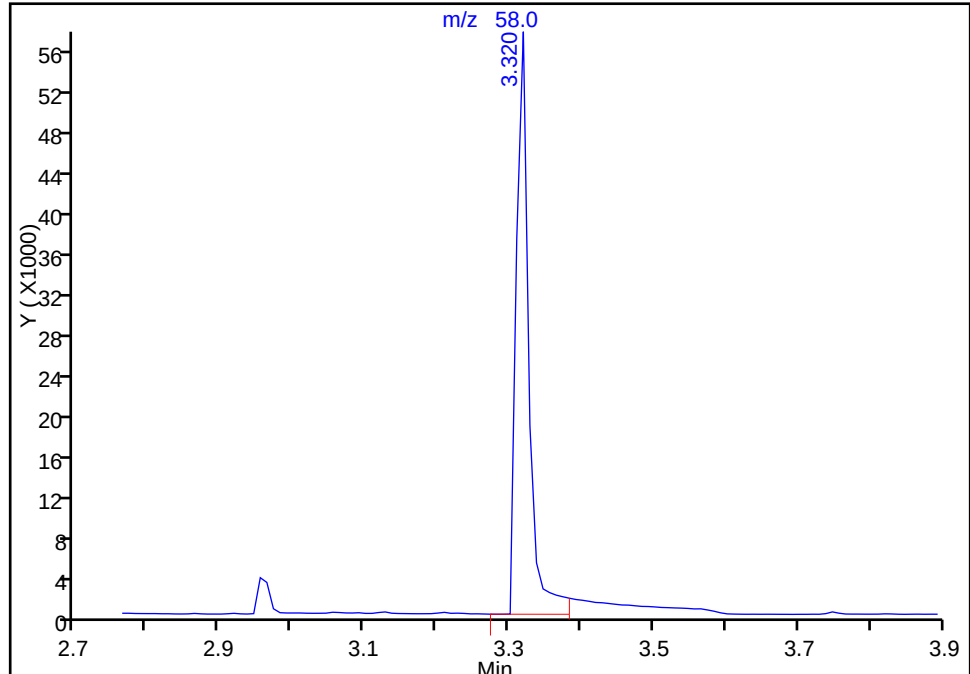
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

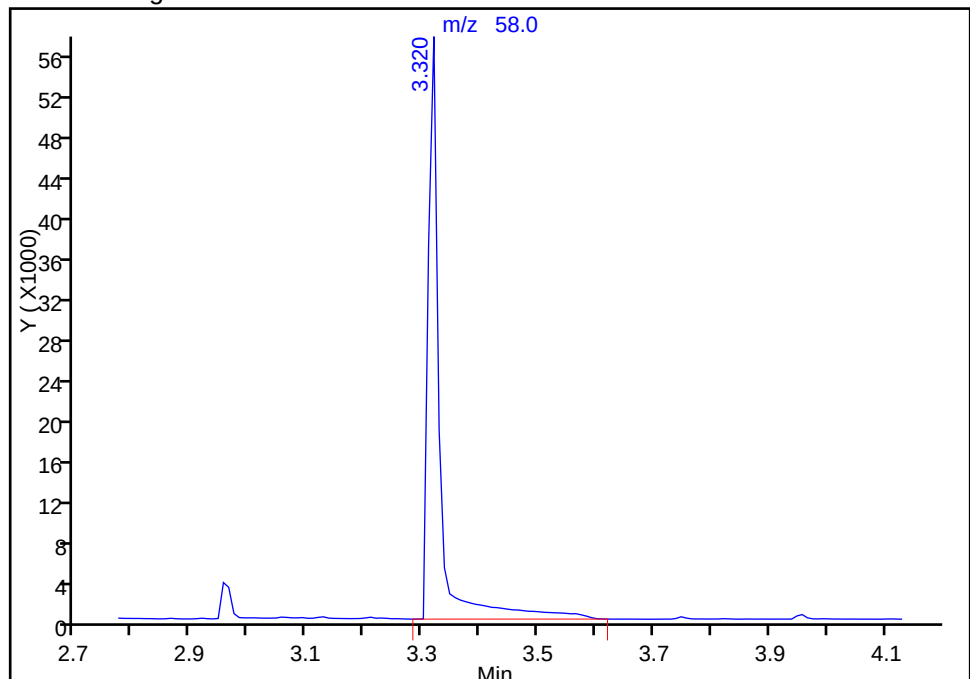
RT: 3.32  
Area: 70442  
Amount: 2.770864  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.32  
Area: 80541  
Amount: 3.168112  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: lardieo, 15-Mar-2017 14:30:17

Audit Action: Manually Integrated

Audit Reason: Peak Tail

FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
SDG No.: \_\_\_\_\_  
Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCSD 320-153806/3-A  
Matrix: Water Lab File ID: S031418.D  
Analysis Method: WS-MS-0011 Date Collected: \_\_\_\_\_  
Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
Sample wt/vol: 1000 (mL) Date Analyzed: 03/14/2017 21:28  
Con. Extract Vol.: 1.0 (mL) Dilution Factor: 1  
Injection Volume: 1 (uL) Level: (low/med) Low  
% Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 3.12   | M | 1.0 | 0.50 | 0.20 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 71   |   | 42-91  |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031418.D  
 Lims ID: LCSD 320-153806/3-A  
 Client ID:  
 Sample Type: LCSD  
 Inject. Date: 14-Mar-2017 21:28:30 ALS Bottle#: 18 Worklist Smp#: 20  
 Injection Vol: 1.0 ul Dil. Factor: 1.0000  
 Sample Info: lcsd 320-153806/3-a  
 Operator ID: Instrument ID: SV1  
 Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
 Limit Group: MSS - 8270SIM 14DX - ICAL  
 Last Update: 15-Mar-2017 08:35:54 Calib Date: 22-Feb-2017 12:09:30  
 Integrator: RTE ID Type: RT Order ID  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
 Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
 Process Host: XAWRK031

First Level Reviewer: onishim

Date: 15-Mar-2017 08:35:54

| Sig                        | RT<br>(min.) | Exp RT<br>(min.) | Dlt RT<br>(min.) | Q  | Response | Cal Amt<br>ug/ml | OnCol Amt<br>ug/ml | Ratio Range | Ratio | Flags |
|----------------------------|--------------|------------------|------------------|----|----------|------------------|--------------------|-------------|-------|-------|
| 1 1,4-Dioxane              |              |                  |                  |    |          |                  |                    |             |       |       |
| 58                         | 3.321        | 3.319            | 0.002            | 78 | 86577    | 10.0             | 3.12               | 80- 120     | 100   | M     |
| 88                         | 3.330        | 3.319            | 0.011            |    | 89622    |                  |                    | 101- 141    | 104   |       |
| * 2 1,4-Dichlorobenzene-d4 |              |                  |                  |    |          |                  |                    |             |       |       |
| 152                        | 7.181        | 7.174            | 0.007            | 95 | 692706   | 10.0             | 10.0               | 80- 120     | 100   |       |
| 150                        | 7.172        | 7.174            | -0.002           |    | 1074860  |                  |                    | 135- 175    | 155   |       |
| 115                        | 7.172        | 7.174            | -0.002           |    | 386477   |                  |                    | 36.2- 76.2  | 55.8  |       |
| \$ 3 Nitrobenzene-d5       |              |                  |                  |    |          |                  |                    |             |       |       |
| 82                         | 8.035        | 8.036            | -0.001           | 97 | 298808   | 5.00             | 3.57               | 80- 120     | 100   |       |
| 128                        | 8.043        | 8.036            | 0.007            |    | 159876   |                  |                    | 33.9- 73.9  | 53.5  |       |
| 54                         | 8.035        | 8.036            | -0.001           |    | 171505   |                  |                    | 36.9- 76.9  | 57.4  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

MS8270IS\_00016

Amount Added: 5.00

Units: uL

Run Reagent

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031418.D

Injection Date: 14-Mar-2017 21:28:30

Instrument ID: SV1

Operator ID:

Lims ID: LCSD 320-153806/3-A

Worklist Smp#: 20

Client ID:

Injection Vol: 1.0 ul

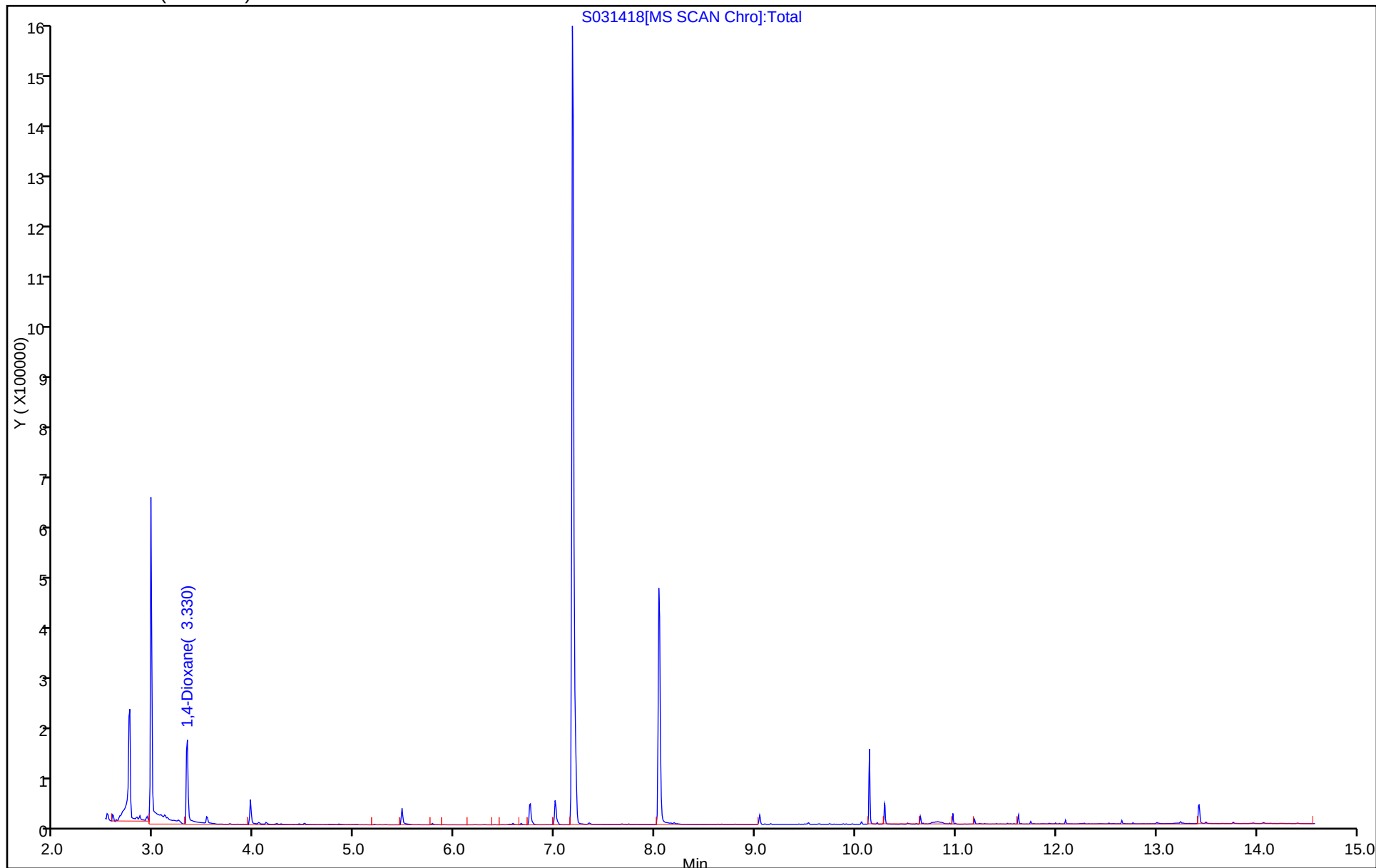
Dil. Factor: 1.0000

ALS Bottle#: 18

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)



TestAmerica Sacramento  
Recovery Report

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031418.D  
Lims ID: LCSD 320-153806/3-A  
Client ID:  
Sample Type: LCSD  
Inject. Date: 14-Mar-2017 21:28:30 ALS Bottle#: 18 Worklist Smp#: 20  
Injection Vol: 1.0 ul Dil. Factor: 1.0000  
Sample Info: lcsd 320-153806/3-a  
Operator ID: Instrument ID: SV1  
Method: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\1,4-Dioxane.m  
Limit Group: MSS - 8270SIM 14DX - ICAL  
Last Update: 15-Mar-2017 08:35:54 Calib Date: 22-Feb-2017 12:09:30  
Integrator: RTE ID Type: RT Order ID  
Quant Method: Internal Standard Quant By: Initial Calibration  
Last ICal File: \\ChromNA\Sacramento\ChromData\SV1\20170222-40122.b\14D0222H.D  
Column 1 : HP-5MS ( 0.25 mm) Det: MS SCAN  
Process Host: XAWRK031

First Level Reviewer: onishim

Date: 15-Mar-2017 08:35:54

| Compound             | Amount Added | Amount Recovered | % Rec. |
|----------------------|--------------|------------------|--------|
| \$ 3 Nitrobenzene-d5 | 5.00         | 3.57             | 71.44  |

## TestAmerica Sacramento

Data File: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b\S031418.D

Injection Date: 14-Mar-2017 21:28:30

Instrument ID: SV1

Lims ID: LCSD 320-153806/3-A

Client ID:

Operator ID:

ALS Bottle#:

18

Worklist Smp#: 20

Injection Vol: 1.0 ul

Dil. Factor: 1.0000

Method: 1,4-Dioxane

Limit Group: MSS - 8270SIM 14DX - ICAL

Column: HP-5MS ( 0.25 mm)

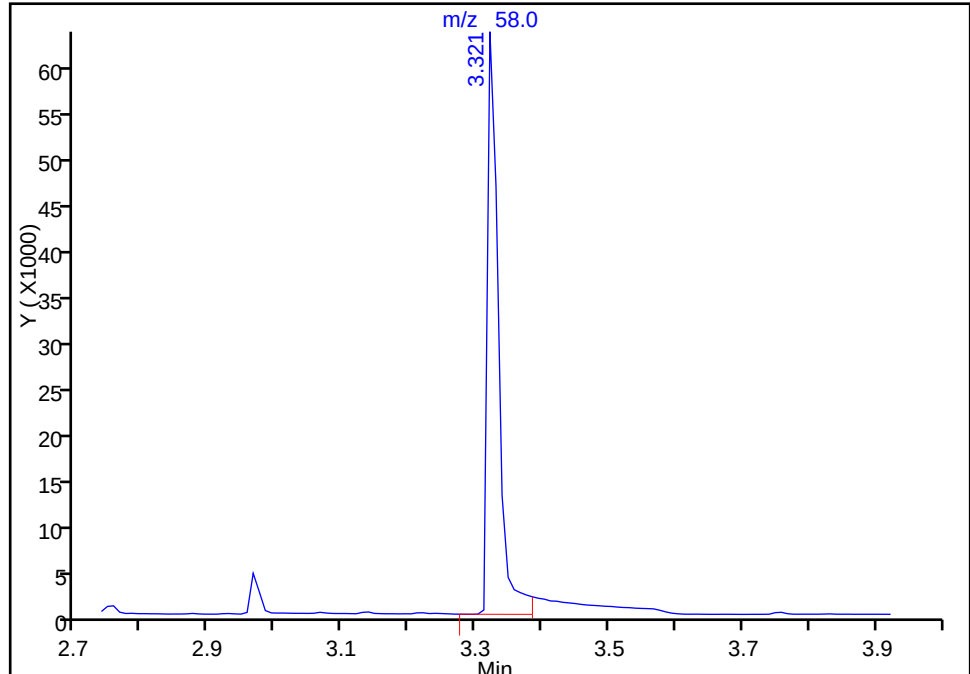
Detector: MS SCAN

**1 1,4-Dioxane, CAS: 123-91-1**

Signal: 1

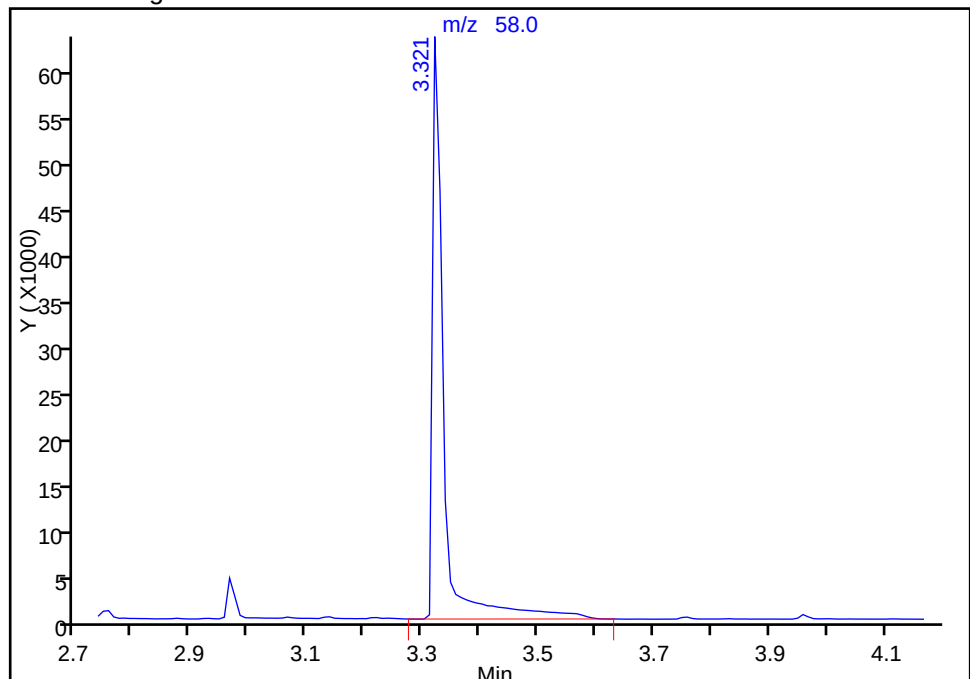
RT: 3.32  
Area: 75095  
Amount: 2.701992  
Amount Units: ug/ml

## Processing Integration Results



RT: 3.32  
Area: 86577  
Amount: 3.115126  
Amount Units: ug/ml

## Manual Integration Results



Reviewer: onishim, 15-Mar-2017 08:35:46

Audit Action: Manually Integrated

Audit Reason: Peak Tail

## GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: SV1 Start Date: 02/22/2017 09:35Analysis Batch Number: 151686 End Date: 02/22/2017 12:31

| LAB SAMPLE ID     | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID | COLUMN ID        |
|-------------------|------------------|------------------|--------------------|-------------|------------------|
| IC 320-151686/1   |                  | 02/22/2017 09:35 | 1                  | 14D0222A.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/2   |                  | 02/22/2017 09:56 | 1                  | 14D0222B.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/3   |                  | 02/22/2017 10:19 | 1                  | 14D0222C.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/4   |                  | 02/22/2017 10:41 | 1                  | 14D0222D.D  | HP-5MS 0.25 (mm) |
| ICIS 320-151686/5 |                  | 02/22/2017 11:03 | 1                  | 14D0222E.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/6   |                  | 02/22/2017 11:25 | 1                  | 14D0222F.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/7   |                  | 02/22/2017 11:47 | 1                  | 14D0222G.D  | HP-5MS 0.25 (mm) |
| IC 320-151686/8   |                  | 02/22/2017 12:09 | 1                  | 14D0222H.D  | HP-5MS 0.25 (mm) |
| ICV 320-151686/9  |                  | 02/22/2017 12:31 | 1                  | 14D0222.D   | HP-5MS 0.25 (mm) |

## GC/MS SEMI VOA ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-26324-1

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

Instrument ID: SV1Start Date: 03/14/2017 14:42Analysis Batch Number: 154875End Date: 03/15/2017 00:49

| LAB SAMPLE ID       | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID | COLUMN ID        |
|---------------------|------------------|------------------|--------------------|-------------|------------------|
| CCV 320-154875/2    |                  | 03/14/2017 14:42 | 1                  | 14D0314.D   | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 15:04 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 15:27 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 15:49 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 16:12 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 16:35 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 16:57 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 17:20 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 17:42 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 18:05 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 18:28 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 18:50 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 19:13 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 19:35 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 19:58 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 20:21 | 1                  |             | HP-5MS 0.25 (mm) |
| MB 320-153806/1-A   |                  | 03/14/2017 20:43 | 1                  | S031416.D   | HP-5MS 0.25 (mm) |
| LCS 320-153806/2-A  |                  | 03/14/2017 21:06 | 1                  | S031417.D   | HP-5MS 0.25 (mm) |
| LCSD 320-153806/3-A |                  | 03/14/2017 21:28 | 1                  | S031418.D   | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 21:50 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 22:13 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 22:35 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 22:57 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 23:20 | 1                  |             | HP-5MS 0.25 (mm) |
| ZZZZZ               |                  | 03/14/2017 23:42 | 1                  |             | HP-5MS 0.25 (mm) |
| 320-26324-5         |                  | 03/15/2017 00:04 | 1                  | S031425.D   | HP-5MS 0.25 (mm) |
| 320-26324-6         |                  | 03/15/2017 00:27 | 1                  | S031426.D   | HP-5MS 0.25 (mm) |
| CCVC 320-154875/29  |                  | 03/15/2017 00:49 | 1                  | 14D0314A.D  | HP-5MS 0.25 (mm) |

## GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Batch Number: 153806 Batch Start Date: 03/08/17 08:41 Batch Analyst: Rafieefar, SinaBatch Method: 3510C Batch End Date: 03/09/17 16:07

| Lab Sample ID        | Client Sample ID       | Method Chain         | Basis | ReceivedpH | GrossWeight | TareWeight | InitialAmount | FinalAmount | MS14DSP 00030 |
|----------------------|------------------------|----------------------|-------|------------|-------------|------------|---------------|-------------|---------------|
| MB 320-153806/1      |                        | 3510C,<br>WS-MS-0011 |       | 8 SU       |             |            | 1000 mL       | 1.0 mL      |               |
| LCS<br>320-153806/2  |                        | 3510C,<br>WS-MS-0011 |       | 8 SU       |             |            | 1000 mL       | 1.0 mL      | 500 uL        |
| LCSD<br>320-153806/3 |                        | 3510C,<br>WS-MS-0011 |       | 8 SU       |             |            | 1000 mL       | 1.0 mL      | 500 uL        |
| 320-26324-D-5        | MEAFF-EB03-GW-03<br>17 | 3510C,<br>WS-MS-0011 | T     | 8 SU       | 1393.4 g    | 510.03 g   | 883.4 mL      | 1.0 mL      |               |
| 320-26324-C-6        | MEAFF-EB04-GW-03<br>17 | 3510C,<br>WS-MS-0011 | T     | 8 SU       | 1445.1 g    | 511.54 g   | 933.6 mL      | 1.0 mL      |               |

| Lab Sample ID        | Client Sample ID       | Method Chain         | Basis | MS14DSU 00003 |  |  |  |  |  |
|----------------------|------------------------|----------------------|-------|---------------|--|--|--|--|--|
| MB 320-153806/1      |                        | 3510C,<br>WS-MS-0011 |       | 0.5 mL        |  |  |  |  |  |
| LCS<br>320-153806/2  |                        | 3510C,<br>WS-MS-0011 |       | 0.5 mL        |  |  |  |  |  |
| LCSD<br>320-153806/3 |                        | 3510C,<br>WS-MS-0011 |       | 0.5 mL        |  |  |  |  |  |
| 320-26324-D-5        | MEAFF-EB03-GW-03<br>17 | 3510C,<br>WS-MS-0011 | T     | 0.5 mL        |  |  |  |  |  |
| 320-26324-C-6        | MEAFF-EB04-GW-03<br>17 | 3510C,<br>WS-MS-0011 | T     | 0.5 mL        |  |  |  |  |  |

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.

WS-MS-0011

Page 1 of 2

## GC/MS SEMI VOA BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Batch Number: 153806 Batch Start Date: 03/08/17 08:41 Batch Analyst: Rafieefar, SinaBatch Method: 3510C Batch End Date: 03/09/17 16:07

| Batch Notes                       |                       |
|-----------------------------------|-----------------------|
| Balance ID                        | QA-036                |
| Base used for pH adjustment       | 10N NaOH              |
| Base Used to Adjust pH ID         | 153803                |
| Batch Comment                     | FV CRM 3/9/17 1mL     |
| Analyst ID - Concentration        | CRM 3/9/17            |
| Na2SO4 ID                         | SS_00347 and SS_00348 |
| Oven, Bath or Block Temperature 1 | 70-75                 |
| Pipette ID                        | K35057E               |
| Prep Solvent ID                   | 0000164143            |
| Prep Solvent Name                 | DCM                   |
| Prep Solvent Volume Used          | 180 mL                |
| Person's name who did the prep    | SR/AAR 03/08/2017     |
| Analyst ID - Reagent Drop Witness | AAR 03/08/2017        |
| Analyst ID - Reagent Drop         | SR 03/08/2017         |
| Vial ID                           | 16293128              |
| Water Bath ID                     | BT:021                |

| 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.



Dec 3/22  
LH

|                                                                            |                                                                                     |                                                        |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>LIMS Batch Number:</b><br>154975                                        | <b>Worklist #:</b><br>40922                                                         | <b>Instrument ID:</b><br>SV1                           |
| <b>Analyst/1<sup>st</sup> Reviewer:</b><br>Aptm/pel 3/15/17                | <b>Method (circle):</b> 625 8270C 8270D TO-13A<br>NPE CWM <u>1,4-Dx</u> PAH PAH-IDA | <b>Analysis Type (circle):</b><br>Full Scan <u>SIM</u> |
| <b>Matrix:</b> <u>Non-potable Water</u> Solid Leachate Tissue<br>Air Waste | <b>QC Type (circle):</b> Standard QAPP <u>DOD</u> Other-<br>Explain <u>QSM 5.0</u>  |                                                        |
| <b>Job Nos:</b><br>320-26103, 320-26105,<br>320-26273, 320-26324           | <b>Prep Batch(es):</b><br>152910, 153906                                            | <b>ICAL Batch:</b><br>151696                           |

| Review Items                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | NA | Yes | No | 2 <sup>nd</sup> Rev | If No, why is data reportable?                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Tune/Calibration Verification</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |    |     |    |                     |                                                                                                                                                               |
| 1. Did DFTPP meet tune criteria? If SIM, did the PFTBA Tune check meet ion ratio criteria?                                                                                                                                                                                                                                                                                                                                                                                                               |    | /   |    | ✓                   |                                                                                                                                                               |
| 2. Are the Benzidine and PCP tailing ≤ 2? (8270D) Benzidine tailing ≤ 3 and PCP tailing ≤ 5? (8270C)                                                                                                                                                                                                                                                                                                                                                                                                     | /  |     |    | ✓                   | If no, list details: _____                                                                                                                                    |
| 3. Is the DDT degradation ≤ 20%                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | /  |     |    | ✓                   | If no, list details: _____                                                                                                                                    |
| 4. Were all standards injected within 12 hr of DFTPP? (or 24 hrs for 625)?                                                                                                                                                                                                                                                                                                                                                                                                                               |    | /   |    | ✓                   | If no, list details: _____                                                                                                                                    |
| 5. Was the correct ICAL used for quantitation? Date and Instrument ID of ICAL verified? (Check in both Chrom/Target and TALS)                                                                                                                                                                                                                                                                                                                                                                            |    | /   |    | ✓                   |                                                                                                                                                               |
| 6. Do the RFs meet method minimum criteria? (8270D/625)<br>Are the RFs for SPCCs ≥ 0.050? (8270C)<br>SPCC: 2,4-Dinitrophenol, 4-Nitrophenol, Hexachlorocyclopentadiene & N-nitroso-di-n-propylamine                                                                                                                                                                                                                                                                                                      |    | /   |    | ✓                   | If no, list details: _____                                                                                                                                    |
| 7. Is the %D (difference or drift) ≤ 20% for all CCCs? All other analytes within 15%, or lab limits (8270C); %D ≤ 20% for all analytes, at least 80% of compounds meet criteria? (8270D) %D ≤ 30% for all analytes (non-DOD SIM) %D ≤ 20% for all analytes (DOD SIM)<br><br>CCC: Phenol, 1,4-DCB, 2-Nitrophenol, 2,4-Dichlorophenol, Hexachlorobutadiene, 4-Chloro-3-methylphenol, 2,4,6-Trichlorophenol, Acenaphthene, N-nitrosodiphenylamine, Pentachlorophenol, Di-n-octyl phthalate & Benzo(a)pyrene |    | /   |    | ✓                   | If no, list details: _____<br>(8270C: %D high, samples ND?) (8270D: <20% of cmpds fail criteria & for failed cmpds RL standard verifies sensitivity for NDs?) |
| 8. For any compound > 20% D (low), was RL standard analyzed and detected? (8270D)                                                                                                                                                                                                                                                                                                                                                                                                                        | /  |     |    | ✓                   |                                                                                                                                                               |
| 9. NOTE: For any compounds > 20% D (high or low), detects will be flagged as "EST" & narrated.                                                                                                                                                                                                                                                                                                                                                                                                           | /  |     |    | ✓                   | □ Must be done in consultation with client.                                                                                                                   |
| 10. Are the internal standard responses within limits?                                                                                                                                                                                                                                                                                                                                                                                                                                                   |    | /   |    | ✓                   | If no, list details: _____                                                                                                                                    |

## TestAmerica Sacramento

## GCMS CCV and Tune Data Review Checklist

|                           |                   |                    |
|---------------------------|-------------------|--------------------|
| LIMS Batch Number: 154975 | Worklist #: 40922 | Instrument ID: SV1 |
|---------------------------|-------------------|--------------------|

|                                                                                                                                                  |   |   |  |   |                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------|---|---|--|---|-------------------------------------------|
| (between -50% and +100% of the mid-level ICAL standard)                                                                                          |   |   |  |   |                                           |
| 11. Are the internal standard retention times within method limits? ( $\pm 30$ sec of ICAL mid pt for 8270C/D)                                   |   |   |  | ✓ | If no, list details: _____                |
| 12. Benzo(b & k)fluoranthene: height of the valley between must be less than 50% of the average of the two peak heights?                         |   |   |  | ✓ |                                           |
| 13. Elution order checked Isomeric pairs and coeluters?                                                                                          |   |   |  |   | Chrom:<br>View/Documents/Methods/Isomers) |
| • aniline / bis(2-chloroethyl)ether                                                                                                              | ✓ |   |  |   |                                           |
| • n-nitrosodiphenylamine/diphenylamine * (conc)                                                                                                  | ✓ |   |  |   |                                           |
| • 1,3-, 1,4-, 1,2-dichlorobenzene                                                                                                                | ✓ |   |  |   |                                           |
| • benzyl alcohol / 2-methylphenol / 4-methylphenol                                                                                               | ✓ |   |  |   |                                           |
| • 2 & 1 - methylnaphthalene                                                                                                                      | ✓ |   |  |   |                                           |
| • 2,4,6- and 2,4,5-trichlorophenol                                                                                                               | ✓ |   |  |   |                                           |
| • phenanthrene / anthracene                                                                                                                      | ✓ |   |  |   |                                           |
| • fluoranthene / pyrene                                                                                                                          | ✓ |   |  |   |                                           |
| • benzo(a)anthracene / chrysene                                                                                                                  | ✓ |   |  |   |                                           |
| • benzo(e)pyrene / benzo(a)pyrene / perylene                                                                                                     | ✓ |   |  |   |                                           |
| • bis(2-ethylhexyl)/di-n-octyl phthalate                                                                                                         | ✓ |   |  |   |                                           |
| • benzo(b)fluoranthene / benzo(k)fluoranthene                                                                                                    | ✓ |   |  |   |                                           |
| • indeno(1,2,3-cd)pyrene / benzo(g,h,i)perylene                                                                                                  | ✓ |   |  |   |                                           |
| • saffrole/1-chloronaphthalene                                                                                                                   | ✓ |   |  |   |                                           |
| • 1-/2-naphthylamine                                                                                                                             | ✓ |   |  |   |                                           |
| • 2 and 1-chloronaphthalene                                                                                                                      | ✓ |   |  |   |                                           |
| • 2,4- and 2,6-dichlorophenol                                                                                                                    | ✓ |   |  |   |                                           |
| 14. If any criteria from items above were not met, was a NCM generated & approved by supervisor?                                                 |   | ✓ |  | ✓ |                                           |
| 15. Were manual integrations performed correctly and properly documented?<br>(dated, initialed and reason given; 2nd review of all MIs required) |   | ✓ |  | ✓ |                                           |
| 16. Is the ICV properly linked?                                                                                                                  |   | ✓ |  | ✓ |                                           |
| 17. Is the FC43 Tune Documentation attached in TALS<br>(SIM Methods: NPE, CWM, 1,4-Dx, PAH, PAH-IDA)                                             |   | ✓ |  | ✓ |                                           |
| 18. Isotope Dilution: S/N for all IDA > 10:1, S/N for targets > 2.5:1                                                                            | ✓ |   |  |   |                                           |
| 19. 1,4-Dx: S/N > 10:1 (client criteria > 20:1)?                                                                                                 |   | ✓ |  | ✓ |                                           |

2<sup>nd</sup> Reviewer:

Review Date:

3/7/17

Comments:

|                                                                            |                                                                                     |                                                        |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>LIMS Batch Number:</b><br>154875                                        | <b>Worklist #:</b><br>40822                                                         | <b>Instrument ID:</b><br>SV1                           |
| <b>Analyst/1<sup>st</sup> Reviewer:</b><br>APIWAL 3/15/17                  | <b>Method (circle):</b> 625 8270C 8270D TO-13A<br>NPE CWM <u>1,4-Dx</u> PAH PAH-IDA | <b>Analysis Type (circle):</b><br>Full Scan <u>SIM</u> |
| <b>Matrix:</b> <u>Non-potable Water</u> Solid Leachate Tissue<br>Air Waste | <b>QC Type (circle):</b> Standard QAPP <u>DOD</u> Other-<br>Explain <u>BSM 5.0</u>  |                                                        |
| <b>Job Nos:</b><br>320 - 26103, 320 - 26105,<br>320 - 26273, 320 - 26324   | <b>Prep Batch(es):</b><br>152910, 153806                                            |                                                        |

| Review Items                                                                                                                              | NA | Yes | No | 2 <sup>nd</sup><br>Rev | If No, why is data reportable?                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>B. Client Sample and QC Sample Results</b>                                                                                             |    |     |    |                        |                                                                                                                                                                                                                                                                                                                                                          |
| 1. All samples & QC injected within method time criteria?<br>(8270C, 8270D 12 hr; 625=24 hr)                                              |    | /   |    | /                      | Time of last Injection: <u>00:49</u>                                                                                                                                                                                                                                                                                                                     |
| 2. LCS (LFB) %recovery within limits?<br>(625=cmpd specific-Table 5 'P' value<br>(All other methods =lab statistical limits)              |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 3. MS/MSD (LFM/LFMD) %recoveries within limits?<br>(625=cmpd specific-Table 5 'P' value)<br>(All other methods =lab statistical limits)   |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 4. MS/MSD RPD within limits?<br>(625=cmpd specific-limits)<br>(All other methods =lab statistical limits)                                 |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 5. Do all spiked samples (LCS, MS, MSD) yield positive detections?<br>Concentrations of ND require evaluation, correction or explanation. |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 6. Are all duplicate or spiked duplicate sample RPDs <75%?<br>Excessive RPDs (>75%) require evaluation, correction or explanation.        |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 7. Target cmpds in Method Blank are below required concentration.                                                                         |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                          |
| 8. Surrogates within %Recovery acceptance limits for all samples and QC?<br>If no, list details:                                          |    | /   |    | /                      | <input type="checkbox"/> Samples submitted for re-extraction<br><input type="checkbox"/> Confirmed by re-extraction<br><input type="checkbox"/> Insufficient sample for re-extraction<br><input type="checkbox"/> Surrogates high, samples ND<br><input type="checkbox"/> Visual Matrix Interference-Client notified-<br>Explain _____<br>_____<br>_____ |
| 9. Internal standard (IS) response between -50% and +100% of (circle one) CCV standard? Mid-point ICAL?<br>If no, list details:           |    | /   |    | /                      | <input type="checkbox"/> High IS response. Sample(s) rerun to confirm, or at dilution.<br><input type="checkbox"/> Low IS response. Sample(s) reanalyzed.                                                                                                                                                                                                |

## TestAmerica Sacramento

## GCMS CCV and Tune Data Review Checklist

|                           |                   |                    |
|---------------------------|-------------------|--------------------|
| LIMS Batch Number: 154875 | Worklist #: 40822 | Instrument ID: SV1 |
|---------------------------|-------------------|--------------------|

| Review Items                                                                                                                                                                   | NA | Yes | No | 2 <sup>nd</sup><br>Rev | If No, why is data reportable?                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|------------------------|-------------------------------------------------------------------------------------------------------------------|
| <b>B. Client Sample and QC Sample Results (continued)</b>                                                                                                                      |    |     |    |                        |                                                                                                                   |
| 10. Are internal standards <0.5 min of IS in last CCV?                                                                                                                         |    | /   |    | /                      |                                                                                                                   |
| 11. Samples with target analyte concentrations > calibration range diluted and reanalyzed?<br><i>If no, list details:</i>                                                      |    | /   |    | /                      | <input type="checkbox"/> Results E flagged                                                                        |
| 11. Are peaks evaluated to assure there are no saturated peaks?                                                                                                                |    | /   |    | /                      |                                                                                                                   |
| 12. Were preparation & analysis Holding Times met for all samples in the batch? Were analytical holding times met for all samples in the batch?<br><i>If no, list details:</i> |    | /   |    | /                      | <input type="checkbox"/> H flag for samples past hold<br><input type="checkbox"/> NCM filed for samples past hold |
| 13. Were prep and dilution factors verified between Chrom and TALS and final report?                                                                                           |    | /   |    | /                      | Comments:                                                                                                         |
| 14. Were spectra for all detections evaluated for correct identification?                                                                                                      |    | /   |    | /                      |                                                                                                                   |
| 15. Was a review performed of all chromatographic peaks that were deleted to verify removal was appropriate?                                                                   |    | /   |    | /                      |                                                                                                                   |
| 16. Were unidentified peaks reviewed for missed target compounds?                                                                                                              |    | /   |    | /                      |                                                                                                                   |
| 17. Were manual integrations performed correctly and properly documented?<br>(dated, initialed and reason given; 2nd review of all MIs required)                               |    | /   |    | /                      |                                                                                                                   |
| 18. Were Isomeric pairs checked for correct assignment?<br>(verify against ICAL & CCV)                                                                                         |    | /   |    | /                      |                                                                                                                   |
| 19. Were results from diluted & undiluted runs compared?                                                                                                                       | /  |     |    | /                      |                                                                                                                   |
| 20. Dilution: Is highest target analyte >20% of calibration range?                                                                                                             | /  |     |    | /                      | <input type="checkbox"/> Is there matrix preventing?<br><input type="checkbox"/> Are clean ups required?          |
| <b>C. Other -- Final Report Data Review</b>                                                                                                                                    |    |     |    |                        |                                                                                                                   |
| 21. Were all project requirements met?                                                                                                                                         |    | /   |    | /                      |                                                                                                                   |
| 22. Samples checked to ensure all requested targets uploaded and reported correctly?                                                                                           |    | /   |    | /                      |                                                                                                                   |
| 23. Results for Samples/LCS/MS/MSD calculated/reported correctly in TALS and in final report?<br><i>Are recovery &amp; RPD limits present in final report?</i>                 |    | /   |    | /                      | (Reagents associated correctly?)<br>(Limits in reference data?)                                                   |
| 24. NCMs reviewed for applicability, correct references to batches/analytes, grammatical/typographical errors?                                                                 |    | /   |    | /                      |                                                                                                                   |
| 25. Raw Data                                                                                                                                                                   |    |     |    |                        |                                                                                                                   |
| a. Unused data is clearly identified                                                                                                                                           |    | /   |    | /                      |                                                                                                                   |
| b. All crossed out data is initialed and dated                                                                                                                                 |    | /   |    | /                      |                                                                                                                   |
| c. Out of control QC is clearly identified                                                                                                                                     |    | /   |    | /                      |                                                                                                                   |
| d. Any data that has a qualifier tick is commented on with appropriate action taken                                                                                            |    | /   |    | /                      |                                                                                                                   |

MSS-002 Rev 1 2016-07-20

Based on Corp Form No. CA-Q-WI-045, Rev. 0, dated 11 Nov 2014

Page 4 of 5

## TestAmerica Sacramento

## GCMS CCV and Tune Data Review Checklist

|                           |                   |                    |
|---------------------------|-------------------|--------------------|
| LIMS Batch Number: 154825 | Worklist #: 40822 | Instrument ID: SV1 |
|---------------------------|-------------------|--------------------|

| Review Items                                                                                   | NA | Yes | No | 2 <sup>nd</sup><br>Rev | If No, why is data reportable?                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------|----|-----|----|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>C. Other -- Final Report Data Review (continued)</b>                                        |    |     |    |                        |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| e. The first page of the run includes the filename, instrument, and analyst initials/signature |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 26. Run Log                                                                                    |    |     |    |                        | If Chrom worklist is used for runlog, all runs upload to Worklist                                                                                                                                                                                                                                                                                                                                                      |
| a. Unused data is clearly identified                                                           |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| b. All crossed out data is initialed and dated, not obliterated                                |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| c. Analyst initials/signature provided                                                         |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 27. TALS Samples Tab                                                                           |    |     |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| a. LIMS Sample IDs / Containers are correct                                                    |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| b. Method and matrix are correct                                                               |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| c. Date and time match raw data                                                                |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| • Dilutions are correct                                                                        |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| • Correct suffix designated (where applicable)                                                 |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 28. TALS Worksheet Tab is complete and correct                                                 |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 29. TALS Reagent Tab is complete and correct                                                   |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 30. TALS QC Links Tab is correct                                                               |    | /   |    | /                      | Missing QC?<br><input type="checkbox"/> Check QC links, to samples and duplicates<br><input type="checkbox"/> Check cross batch links<br><input type="checkbox"/> QC at second level review?<br>Missing limits?<br><input checked="" type="checkbox"/> Check QC links<br><input type="checkbox"/> Check spike (reagents) associated with appropriate analytes<br><input type="checkbox"/> check limits in ref. data-QA |
| 31. TALS Sample Results Tab                                                                    |    |     |    |                        |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| a. All unused data are marked Rejected or Accepted                                             |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| b. All reported analytes are marked Primary or Secondary                                       |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| c. Flags are correctly applied (no flags missing)                                              |    | /   |    | /                      | <input type="checkbox"/> Apply manually<br><input type="checkbox"/> Failing condition not propagated to samples- Re-calc                                                                                                                                                                                                                                                                                               |
| 32. TALS Batch Information Screen documentation is complete                                    |    | /   |    | /                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 32. TALS Status set to appropriate review level                                                |    | /   |    | /                      | <input type="checkbox"/> Check for "yellow calculator"                                                                                                                                                                                                                                                                                                                                                                 |

2<sup>nd</sup> Reviewer:

Review Date:

Comments:

GCMS Semivolatile ICAL Data Review Checklist

*Internal Standard*

|                                                                |                                                                                |                                                   |
|----------------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------|
| LIMS Batch Number:<br><b>151686</b>                            | Worklist #:<br><b>40122</b>                                                    | Instrument ID:<br><b>SV1 (2/22/17)</b>            |
| Analyst/1 <sup>st</sup> Reviewer:<br><b>ONL</b>                | Method (circle): 625 8270C 8270D TO-13A<br>NPE CWM <b>(1,4-Dx)</b> PAH PAH-IDA | Analysis Type (circle):<br>Full Scan <b>(SIM)</b> |
| QC Type (circle): <b>Standard</b> QAPP DOD Other-Explain _____ |                                                                                |                                                   |

| Review Items                                                                                                                                                                                                                                                                       | NA | Yes | No | 2 <sup>nd</sup> Rev | If No, why is data reportable?                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|----|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A: Tune/Calibration Verification</b>                                                                                                                                                                                                                                            |    |     |    |                     |                                                                                                                                                                                                                              |
| 1. Did DFTPP meet tune criteria? If SIM, did the PFTBA Tune check meet ion ratio criteria?                                                                                                                                                                                         |    | ✓   |    | ✓                   |                                                                                                                                                                                                                              |
| 2. Are the Benzidine and PCP tailing ≤ 2? (8270D) Benzidine tailing ≤ 3 and PCP tailing ≤ 5? (8270C)                                                                                                                                                                               | ✓  |     |    |                     | If no, list details: _____                                                                                                                                                                                                   |
| 3. Is the DDT degradation ≤ 20%                                                                                                                                                                                                                                                    | ✓  |     |    |                     | If no, list details: _____                                                                                                                                                                                                   |
| 4. Were all standards injected within 12 hr of DFTPP? (or 24 hrs for 625)?                                                                                                                                                                                                         |    | ✓   |    | ✓                   | If no, list details: _____                                                                                                                                                                                                   |
| 5. Were ≥ 5 levels of each compound analyzed? (≥ 3 levels for 625) (≥ 5 levels of surrogate analyzed for DoD)?                                                                                                                                                                     |    | ✓   |    | ✓                   |                                                                                                                                                                                                                              |
| 6. Was low level standard at or below RL?                                                                                                                                                                                                                                          |    | ✓   |    | ✓                   |                                                                                                                                                                                                                              |
| 7. If calibration points removed, were reasons for removal documented? Did sufficient calibration points remain? (removal from middle of curve not allowed)                                                                                                                        |    | ✓   |    | ✓                   | (e.g.; some points <RL removed)                                                                                                                                                                                              |
| 8. Does the low level standard have enough sensitivity to produce at least 5-10 scans across the peak, and all secondary ions are present?                                                                                                                                         |    | ✓   |    | ✓                   |                                                                                                                                                                                                                              |
| 9. Do the average RFs meet minimum RF requirements? (625 – not method defined) (8270C-SPCCs = ≥0.05) (8270D- all cmpds have min RFs defined in method/SOP)                                                                                                                         |    | ✓   |    | ✓                   | SPCC: 2,4-Dinitrophenol, 4-Nitrophenol, Hexachlorocyclopentadiene & N-nitroso-di-n-propylamine                                                                                                                               |
| 10. Did the calibration %RSD meet method requirements? (625: ≤ 35% all cmpds) (8270C: ≤ 30% for CCCs & ≤ 15% for all other cmpds/surrogates) (8270D: ≤ 20% for all cmpds/surrogates) (SIM Methods: ≤ 30% for all cmpds/surrogates (Std) or : ≤ 15% for all cmpds/surrogates (DOD)) |    | ✓   |    | ✓                   | CCC: Phenol, 1,4-DCB, 2-Nitrophenol, 2,4-Dichlorophenol, Hexachlorobutadiene, 4-Chloro-3-methylphenol, 2,4,6-Trichlorophenol, Acenaphthene, N-nitrosodiphenylamine, Pentachlorophenol, Di-n-octyl phthalate & Benzo(a)pyrene |
| 11. Was a linear or quadratic regression fit used for analytes that exceeded the %RSD requirements?                                                                                                                                                                                | ✓  |     |    |                     |                                                                                                                                                                                                                              |
| 12. If regression fit used, is correlation coefficient ≥ 0.990?                                                                                                                                                                                                                    | ✓  |     |    |                     |                                                                                                                                                                                                                              |
| 13. Does the low point of a linear regression fit meet                                                                                                                                                                                                                             | ✓  |     |    |                     |                                                                                                                                                                                                                              |

LIMS Batch Number: 151686

Worklist #: 40122

Instrument ID: SVI

| the $\pm 30\%$ read-back criteria? (8270D)                                                                                                                                                                                                                                              |   |   |  |   |                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|--|---|---------------------------------------------------------------------------------------------------------------------------------------|
| 14. At least 6 consecutive points used for quadratic curves?                                                                                                                                                                                                                            | / |   |  |   |                                                                                                                                       |
| 15. For quadratic – examine plot: Is a tangent's slope to the curve entirely positive or negative and continuous?<br>(does not flatten or recurve within the range of calibration)                                                                                                      | ✓ |   |  |   |                                                                                                                                       |
| 16. For quadratic – evaluate curve fitting errors: Does each point fall within criteria when 'read-back' against the curve?<br>(TA requirement – CA-Q-S-005; recommended limits $\pm 30\%$ low point & $\pm 20\%$ all other points) (Chrom Report = Details of Calibration per Analyte) | ✓ |   |  |   |                                                                                                                                       |
| 17. Is the concentration intercept $<  RL $ for each cmpd? ("X" intercept in Chrom; "Y" intercept in Target)                                                                                                                                                                            |   | / |  | / |                                                                                                                                       |
| 18. Were manual integrations performed correctly and properly documented?<br>(dated, initialed and reason given; 2 <sup>nd</sup> review of all MIs required)                                                                                                                            |   | / |  | / | Reasons: 1) Split Peak; 2) Undetected peak; 3) Tailing; 4) RT shift; 5) Wrong peak selected; 6) Baseline Correction; 7) Other-explain |
| 19. Was the high point checked for detector saturation?                                                                                                                                                                                                                                 |   | / |  | / |                                                                                                                                       |
| 20. Do the relative retention times for each analyte in each standard agree within $\pm 0.006$ units?                                                                                                                                                                                   |   | / |  | / |                                                                                                                                       |
| 21. Benzo(b & k)fluoranthene: height of the valley between must be less than 50% of the average of the two peak heights?                                                                                                                                                                | / |   |  |   |                                                                                                                                       |
| 22. Elution order checked Isomeric pairs and coeluters?                                                                                                                                                                                                                                 |   |   |  |   | Chrom: View/Documents/Methods/Isomers)                                                                                                |
| • aniline / bis(2-chloroethyl)ether                                                                                                                                                                                                                                                     | / |   |  |   |                                                                                                                                       |
| • n-nitrosodiphenylamine/diphenylamine * (conc)                                                                                                                                                                                                                                         | / |   |  |   |                                                                                                                                       |
| • 1,3- , 1,4- , 1,2-dichlorobenzene                                                                                                                                                                                                                                                     | ✓ |   |  |   |                                                                                                                                       |
| • benzyl alcohol / 2-methylphenol / 4-methylphenol                                                                                                                                                                                                                                      | / |   |  |   |                                                                                                                                       |
| • 2 & 1 - methylnaphthalene                                                                                                                                                                                                                                                             | ✓ |   |  |   |                                                                                                                                       |
| • 2,4,6- and 2,4,5-trichlorophenol                                                                                                                                                                                                                                                      | ✓ |   |  |   |                                                                                                                                       |
| • phenanthrene / anthracene                                                                                                                                                                                                                                                             | / |   |  |   |                                                                                                                                       |
| • fluoranthene / pyrene                                                                                                                                                                                                                                                                 | / |   |  |   |                                                                                                                                       |
| • benzo(a)anthracene / chrysene                                                                                                                                                                                                                                                         | / |   |  |   |                                                                                                                                       |
| • benzo(e)pyrene / benzo(a)pyrene / perylene                                                                                                                                                                                                                                            | ✓ |   |  |   |                                                                                                                                       |
| • bis(2-ethylhexyl)/di-n-octyl phthalate                                                                                                                                                                                                                                                | ✓ |   |  |   |                                                                                                                                       |
| • benzo(b)fluoranthene / benzo(k)fluoranthene                                                                                                                                                                                                                                           | ✓ |   |  |   |                                                                                                                                       |
| • indeno(1,2,3-cd)pyrene / benzo(g,h,i)perylene                                                                                                                                                                                                                                         | ✓ |   |  |   |                                                                                                                                       |
| • safrole/1-chloronaphthalene                                                                                                                                                                                                                                                           | ✓ |   |  |   |                                                                                                                                       |
| • 1-/2-naphthylamine                                                                                                                                                                                                                                                                    | / |   |  |   |                                                                                                                                       |
| • 2 and 1-chloronaphthalene                                                                                                                                                                                                                                                             | / |   |  |   |                                                                                                                                       |
| • 2,4- and 2,6-dichlorophenol                                                                                                                                                                                                                                                           | / |   |  |   |                                                                                                                                       |
| • 2,4,6 and 2,4,5-tribromophenol                                                                                                                                                                                                                                                        | / |   |  |   |                                                                                                                                       |

TestAmerica Laboratories  
Worklist Run Log Report

Worklist Name: 40822\_031417\_14D

Worklist Num: 40822

Instrument: SV1

Method: 1,4-Dioxane

Batch Directory: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b

Analysis Type: SemiVOA

Creator: Onishi, Marc

Inj Volume: 1.00

Inj Vol Units: ul

Run Reagents:

MS8270IS\_00016, Amount Added: 5.00 , Units: uL

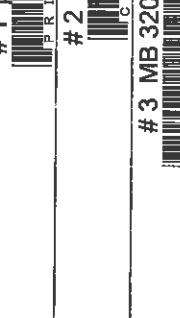
| Lab ID              | Worklist ID     | Sample Type | Inj Date/Time        | File Name  | Vial | Dil Factor | Client ID           | Fract |
|---------------------|-----------------|-------------|----------------------|------------|------|------------|---------------------|-------|
| primer              | 320-0040822-001 | Client      | 14-Mar-2017 14:16:30 | QC031401.D | 96   | 1.0        |                     | sv    |
| CCV                 | 320-0040822-002 | CCV         | 14-Mar-2017 14:42:30 | 14D0314.D  | 96   | 1.0        |                     | sv    |
| MB 320-152910/1-A   | 320-0040822-003 | MB          | 14-Mar-2017 15:04:30 | S031401.D  | 1    | 1.0        |                     | sv    |
| LCS 320-152910/2-A  | 320-0040822-004 | LCS         | 14-Mar-2017 15:27:30 | S031402.D  | 2    | 1.0        |                     | sv    |
| LCSD 320-152910/3-A | 320-0040822-005 | LCSD        | 14-Mar-2017 15:49:30 | S031403.D  | 3    | 1.0        |                     | sv    |
| 320-26103-A-6-A     | 320-0040822-006 | Client      | 14-Mar-2017 16:12:30 | S031404.D  | 4    | 1.0        | MEAFF-MRD-0504-0217 | sv    |
| 320-26103-C-7-A     | 320-0040822-007 | Client      | 14-Mar-2017 16:35:30 | S031405.D  | 5    | 1.0        | MEAFF-MRD-0621-0217 | sv    |
| 320-26103-A-11-A    | 320-0040822-008 | Client      | 14-Mar-2017 16:57:30 | S031406.D  | 6    | 1.0        | MEAFF-MRD-0503-0217 | sv    |
| 320-26103-D-12-A    | 320-0040822-009 | Client      | 14-Mar-2017 17:20:30 | S031407.D  | 7    | 1.0        | MEAFF-MRD-0615-0217 | sv    |
| 320-26105-B-1-A     | 320-0040822-010 | Client      | 14-Mar-2017 17:42:30 | S031408.D  | 8    | 1.0        | MEAFF-08MW01D-0217  | sv    |
| 320-26105-A-2-A     | 320-0040822-011 | Client      | 14-Mar-2017 18:05:30 | S031409.D  | 9    | 1.0        | MEAFF-08MW01-0217   | sv    |
| 320-26105-A-3-A     | 320-0040822-012 | Client      | 14-Mar-2017 18:28:30 | S031410.D  | 10   | 1.0        | MEAFF-MRD-1A14-0217 | sv    |
| 320-26105-A-3-B MS  | 320-0040822-013 | MS          | 14-Mar-2017 18:50:30 | S031411.D  | 11   | 1.0        | MEAFF-MRD-1A14-0217 | sv    |
| 320-26105-A-3-C MSD | 320-0040822-014 | MSD         | 14-Mar-2017 19:13:30 | S031412.D  | 12   | 1.0        | MEAFF-MRD-1A14-0217 | sv    |
| 320-26105-B-12-A    | 320-0040822-015 | Client      | 14-Mar-2017 19:35:30 | S031413.D  | 13   | 1.0        | MEAFF-08MW03-0217   | sv    |
| 320-26105-B-13-A    | 320-0040822-016 | Client      | 14-Mar-2017 19:58:30 | S031414.D  | 14   | 1.0        | MEAFF-08MW06-0217   | sv    |
| 320-26105-A-14-A    | 320-0040822-017 | Client      | 14-Mar-2017 20:21:30 | S031415.D  | 15   | 1.0        | MEAFF-FD02-0217     | sv    |
| MB 320-153806/1-A   | 320-0040822-018 | MB          | 14-Mar-2017 20:43:30 | S031416.D  | 16   | 1.0        |                     | sv    |
| LCS 320-153806/2-A  | 320-0040822-019 | LCS         | 14-Mar-2017 21:06:30 | S031417.D  | 17   | 1.0        |                     | sv    |
| LCSD 320-153806/3-A | 320-0040822-020 | LCSD        | 14-Mar-2017 21:28:30 | S031418.D  | 18   | 1.0        |                     | sv    |
| 320-26273-A-1-A     | 320-0040822-021 | Client      | 14-Mar-2017 21:50:30 | S031419.D  | 19   | 1.0        | MEAFF-4AMW03-0317   | sv    |
| 320-26273-B-2-A     | 320-0040822-022 | Client      | 14-Mar-2017 22:13:30 | S031420.D  | 20   | 1.0        | MEAFF-MRD-0630-0317 | sv    |
| 320-26273-B-3-A     | 320-0040822-023 | Client      | 14-Mar-2017 22:35:30 | S031421.D  | 21   | 1.0        | MEAFF-4AMW01-0317   | sv    |
| 320-26273-A-4-A     | 320-0040822-024 | Client      | 14-Mar-2017 22:57:30 | S031422.D  | 22   | 1.0        | MEAFF-4CMW01-0317   | sv    |
| 320-26273-B-5-A     | 320-0040822-025 | Client      | 14-Mar-2017 23:20:30 | S031423.D  | 23   | 1.0        | MEAFF-4CMW03-0317   | sv    |
| 320-26273-B-6-A     | 320-0040822-026 | Client      | 14-Mar-2017 23:42:30 | S031424.D  | 24   | 1.0        | MEAFF-FD05-0317     | sv    |
| 320-26324-D-5-A     | 320-0040822-027 | Client      | 15-Mar-2017 00:04:30 | S031425.D  | 25   | 1.0        | MEAFF-EB03-GW-0317  | sv    |
| 320-26324-C-6-A     | 320-0040822-028 | Client      | 15-Mar-2017 00:27:30 | S031426.D  | 26   | 1.0        | MEAFF-EB04-GW-0317  | sv    |
| CCVC                | 320-0040822-029 | CCVC        | 15-Mar-2017 00:49:30 | 14D0314A.D | 96   | 1.0        |                     | sv    |

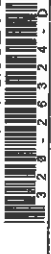


TestAmerica Laboratories  
Worklist Report

Worklist Name: 40822\_031417\_14D  
Instrument Name: SV1  
Injection Volume: 1.000000  
Analysis Type: Semi VOA  
Batch Directory: \\ChromNA\Sacramento\ChromData\SV120170314-40822.b  
Upload Directory: \\CORPTALSAPP12\320-WS-RawData\Organics\MS\SV1  
Run Reagent: MS8270IS\_00016  
Amount Added: 5.000000, Units: uL

Worklist Number: 40822  
Chrom Method: 1,4-Dioxane  
Units: ul

| Worklist ID     | Lims ID                                                                                                        | Sample Reagents | Smp Type | Fract | Initial Vol/Wt | Vol/Wt Units | Dil Fact |
|-----------------|----------------------------------------------------------------------------------------------------------------|-----------------|----------|-------|----------------|--------------|----------|
| 320-0040822-001 | # 1 primer<br>              | MS14DL5_00010   | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-002 | # 2 CCV<br>                 | MS14DL5_00010   | CCV      | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-003 | # 3 MB 320-152910/1-A<br>   |                 | MB       | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-004 | # 4 LCS 320-152910/2-A<br>  |                 | LCS      | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-005 | # 5 LCSD 320-152910/3-A<br> |                 | LCSD     | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-006 | # 6 320-26103-A-6-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-007 | # 7 320-26103-C-7-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-008 | # 8 320-26103-A-11-A<br>    |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-009 | # 9 320-26103-D-12-A<br>    |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-010 | #10 320-26105-B-1-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-011 | #11 320-26105-A-2-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-012 | #12 320-26105-A-3-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-013 | #13 320-26105-A-3-B MS<br>  |                 | MS       | sv    | 1.000000       | mL           | 1.000000 |

| Worklist ID     | Lims ID                                                                                                        | Sample Reagents | Smp Type | Fract | Initial Vol/Wt | Vol/Wt Units | Dil Fact |
|-----------------|----------------------------------------------------------------------------------------------------------------|-----------------|----------|-------|----------------|--------------|----------|
| 320-0040822-014 | #14 320-26105-A-3-C MSD<br> |                 | MSD      | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-015 | #15 320-26105-B-12-A<br>    |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-016 | #16 320-26105-B-13-A<br>    |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-017 | #17 320-26105-A-14-A<br>    |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-018 | #18 MB 320-153806/1-A<br>   |                 | MB       | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-019 | #19 LCS 320-153806/2-A<br>  |                 | LCS      | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-020 | #20 LCSD 320-153806/3-A<br> |                 | LCSD     | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-021 | #21 320-26273-A-1-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-022 | #22 320-26273-B-2-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-023 | #23 320-26273-B-3-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-024 | #24 320-26273-A-4-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-025 | #25 320-26273-B-5-A<br>     |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-026 | #26 320-26273-B-6-A<br>   |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-027 | #27 320-26324-D-5-A<br>   |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-028 | #28 320-26324-C-6-A<br>   |                 | Client   | sv    | 1.000000       | mL           | 1.000000 |
| 320-0040822-029 | #29 CCVC<br>              | MS14DL5_00010   | CCVC     | sv    | 1.000000       | mL           | 1.000000 |

TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 40822\_031417\_14D

Worklist Number: 40822

Instrument Name: SV1

Chrom Method: 1,4-Dioxane

Data Directory: \\ChromNA\Sacramento\ChromData\SV1\20170314-40822.b

QC Batching: Disabled

Limit Group Batching: Enabled

| QC Batch: 1             | MSS - 8270SIM 14DX - ICAL<br>Raw Batch: 154875 |
|-------------------------|------------------------------------------------|
| # 1 primer              | # 1 primer                                     |
| # 2 CCV                 | # 2 CCV                                        |
| # 3 MB 320-152910/1-A   | # 3 MB 320-152910/1-A                          |
| # 4 LCS 320-152910/2-A  | # 4 LCS 320-152910/2-A                         |
| # 5 LCSD 320-152910/3-A | # 5 LCSD 320-152910/3-A                        |
| # 6 320-26103-A-6-A     | # 6 320-26103-A-6-A                            |
| # 7 320-26103-C-7-A     | # 7 320-26103-C-7-A                            |
| # 8 320-26103-A-11-A    | # 8 320-26103-A-11-A                           |
| # 9 320-26103-D-12-A    | # 9 320-26103-D-12-A                           |
| #10 320-26105-B-1-A     | #10 320-26105-B-1-A                            |
| #11 320-26105-A-2-A     | #11 320-26105-A-2-A                            |
| #12 320-26105-A-3-A     | #12 320-26105-A-3-A                            |
| #13 320-26105-A-3-B MS  | #13 320-26105-A-3-B MS                         |
| #14 320-26105-A-3-C MSD | #14 320-26105-A-3-C MSD                        |
| #15 320-26105-B-12-A    | #15 320-26105-B-12-A                           |
| #16 320-26105-B-13-A    | #16 320-26105-B-13-A                           |
| #17 320-26105-A-14-A    | #17 320-26105-A-14-A                           |
| #18 MB 320-153806/1-A   | #18 MB 320-153806/1-A                          |
| #19 LCS 320-153806/2-A  | #19 LCS 320-153806/2-A                         |
| #20 LCSD 320-153806/3-A | #20 LCSD 320-153806/3-A                        |
| #21 320-26273-A-1-A     | #21 320-26273-A-1-A                            |
| #22 320-26273-B-2-A     | #22 320-26273-B-2-A                            |
| #23 320-26273-B-3-A     | #23 320-26273-B-3-A                            |
| #24 320-26273-A-4-A     | #24 320-26273-A-4-A                            |
| #25 320-26273-B-5-A     | #25 320-26273-B-5-A                            |
| #26 320-26273-B-6-A     | #26 320-26273-B-6-A                            |
| #27 320-26324-D-5-A     | #27 320-26324-D-5-A                            |
| #28 320-26324-C-6-A     | #28 320-26324-C-6-A                            |
| #29 CCVC                | #29 CCVC                                       |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Batch End:

## Liquid-Liquid Extraction (Separatory Funnel)

Box # 0317-E

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt | InitAmnt<br>FinAmnt | PHs<br>Rcvd Adj1 Adj2 | Due Date | Analytical<br>TAT | Div<br>Rank | Comments | Output Sample Lab ID |
|--------------------------------------------|----------------------|-------------------|---------------------|-----------------------|----------|-------------------|-------------|----------|----------------------|
| 1 MB-320-152910/1<br>N/A                   | N/A                  |                   | 1000 mL<br>1.0 mL   | 8                     | N/A      | N/A               | N/A         |          | MB 320-152910/1-A    |
| 2 LCS-320-152910/2<br>N/A                  | N/A                  |                   | 1000 mL<br>1.0 mL   | 8                     | N/A      | N/A               | N/A         |          | LCS 320-152910/2-A   |
| 3 LCSD-320-152910/3<br>N/A                 | N/A                  |                   | 1000 mL<br>1.0 mL   | 8                     | N/A      | N/A               | N/A         |          | LCSD 320-152910/3-A  |
| 4 320-26103-A-6<br>(8270_SIM_14DX)         | N/A<br>(320-26103-1) | 578.6 g           | 1.0 mL              | 7                     | 2/27/17  | 23_Days           | 4           |          | 320-26103-A-6-A      |
| 5 320-26103-C-7<br>(8270_SIM_14DX)         | N/A<br>(320-26103-1) | 578.9 g           | 1.0 mL              | 5                     | 2/27/17  | 23_Days           | 4           |          | 320-26103-C-7-A      |
| 6 320-26103-A-11<br>(8270_SIM_14DX)        | N/A<br>(320-26103-1) | 549.9 g           | 1.0 mL              | 7                     | 2/27/17  | 23_Days           | 4           |          | 320-26103-A-11-A     |
| 7 320-26103-D-12<br>(8270_SIM_14DX)        | N/A<br>(320-26103-1) | 547.5 g           | 1.0 mL              | 5                     | 2/27/17  | 23_Days           | 4           |          | 320-26103-D-12-A     |
| 8 320-26105-A-14<br>(8270_SIM_14DX)        | N/A<br>(320-26105-1) | 555.1 g           | 1.0 mL              | 7                     | 3/2/17   | 23_Days           | 4           |          | 320-26105-A-14-A     |
| 9 320-26079-D-4<br>(8270_SIM_14DX)         | N/A<br>(320-26078-1) | 1470.4 g          | 1.0 mL              | 8                     | 3/2/17   | 8_Days            | 2           |          | 320-26079-D-4-A      |
| 10 320-26079-E-6<br>(8270_SIM_14DX)        | N/A<br>(320-26078-1) | 1530.4 g          | 1.0 mL              | 8<br>SR 03/02/17      | 3/2/17   | 8_Days            | 2           |          | 320-26079-E-6-A      |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Method Code: 320-3510C\_IVWT-320

Batch End:

|    |                                      |                                    |          |        |   |  |  |        |         |   |                                                                                                                         |
|----|--------------------------------------|------------------------------------|----------|--------|---|--|--|--------|---------|---|-------------------------------------------------------------------------------------------------------------------------|
| 11 | 320-26079-E-7<br>(8270_SIM_14DX)     | N/A<br>(320-26078-1)               | 1501.3 g | 1.0 mL | 8 |  |  | 3/2/17 | 8_Days  | 2 |                                        |
| 12 | 320-26079-E-8<br>(8270_SIM_14DX)     | N/A<br>(320-26078-1)               | 1528.4 g | 1.0 mL | 8 |  |  | 3/2/17 | 8_Days  | 2 |                                        |
| 13 | 320-26095-G-1<br>(8270_SIM_14DX)     | GWIM 2/17 Surface<br>(320-26095-1) | 1473.6 g | 1.0 mL | 8 |  |  | 3/3/17 | 12_Days | 2 |                                        |
| 14 | 320-26105-B-1<br>(8270_SIM_14DX)     | N/A<br>(320-26105-1)               | 1561.7 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                        |
| 15 | 320-26105-A-2<br>(8270_SIM_14DX)     | N/A<br>(320-26105-1)               | 1136.1 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 | dark brown<br>water + particulates<br> |
| 16 | 320-26105-A-3<br>(8270_SIM_14DX)     | N/A<br>(320-26105-1)               | 1560.1 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                        |
| 17 | 320-26105-A-3-MS<br>(8270_SIM_14DX)  | N/A<br>(320-26105-1)               | 1566.4 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                        |
| 18 | 320-26105-A-3-MSD<br>(8270_SIM_14DX) | N/A<br>(320-26105-1)               | 1568.6 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                        |
| 19 | 320-26105-B-12<br>(8270_SIM_14DX)    | N/A<br>(320-26105-1)               | 1548.0 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                      |
| 20 | 320-26105-B-13<br>(8270_SIM_14DX)    | N/A<br>(320-26105-1)               | 1559.4 g | 1.0 mL | 7 |  |  | 3/2/17 | 23_Days | 4 |                                      |

SR  
03/02/17

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Batch End:

| Batch Notes                          |                   |
|--------------------------------------|-------------------|
| Person's name who did the prep       | SR/AAR 03/02/2017 |
| Prep Solvent Name                    | DCM               |
| Prep Solvent ID                      | 0000164143        |
| Prep Solvent Volume Used             | 180               |
| Analyst ID - Reagent Drop            | SR 03/02/17       |
| Analyst ID - Reagent Drop Witness    | GAR 3/2/17        |
| Analyst ID - SU Reagent Drop         |                   |
| Analyst ID - SU Reagent Drop Witness |                   |
| Acid used for pH adjustment          |                   |
| Acid Used for pH Adjustment ID       |                   |
| Base used for pH adjustment          |                   |
| Base Used to Adjust pH ID            |                   |
| Silica Gel ID                        |                   |
| Analyst ID - Concentration           |                   |
| Exchange Solvent Name                |                   |
| Exchange Solvent ID                  |                   |
| Concentration Start Time             |                   |
| Concentration End Time               |                   |
| Na2SO4 ID                            |                   |
| Water Bath ID                        |                   |
| Uncorrected Temperature              |                   |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Method Code: 320-3510C\_IVWT-320

Analyst: Raffieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Batch End:

|                                    |  |
|------------------------------------|--|
| Oven, Bath or Block Temperature 1  |  |
| Sufficient volume for MS/MSD?      |  |
| Analyst ID - Clean Up              |  |
| Florissil ID                       |  |
| Acid used for Clean Up ID          |  |
| Sulfuric Acid ID                   |  |
| TBA ID                             |  |
| HPLC H2O ID                        |  |
| NaCl ID                            |  |
| Balance ID QA-036                  |  |
| Florissil Solution Reagent ID      |  |
| Mercury ID                         |  |
| Filter Paper ID                    |  |
| Pipette ID K35057E                 |  |
| Syringe ID                         |  |
| N-evap ID                          |  |
| N-evap Temperature                 |  |
| Uncorrected N-evap Temperature     |  |
| pH Paper ID                        |  |
| Thermometer ID                     |  |
| Analyst ID - Spike Analyst         |  |
| Analyst ID - Spike Witness Analyst |  |
| Vial ID                            |  |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Method Code: 320-3510C\_IVWT-320

Batch End:

Batch Comment

## Comments

|               |                  |                                                                                         |
|---------------|------------------|-----------------------------------------------------------------------------------------|
| 320-26079-D-4 | Method Comments: | SEE QAS                                                                                 |
| 320-26079-E-6 | Method Comments: | SEE QAS                                                                                 |
| 320-26079-E-7 | Method Comments: | SEE QAS                                                                                 |
| 320-26079-E-8 | Method Comments: | SEE QAS                                                                                 |
| 320-26095-G-1 | Method Comments: | No BKK_Must have LCSD and MS/MSD per Batch, NCM if not enough to do MS/MSD; historicals |
| 320-26105-A-2 | Method Comments: | limited volume                                                                          |



# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Method Code: 320-3510C\_IVWT-320

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code  | Amount Added | Final Amount | By | Witness |
|-------------------|---------------|--------------|--------------|----|---------|
| MB 320-152910/1   | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| LCS 320-152910/2  | MS14DSP_00030 | 500 uL       | 1.0 mL       |    |         |
| LCS 320-152910/2  | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| LCSD 320-152910/3 | MS14DSP_00030 | 500 uL       | 1.0 mL       |    |         |
| LCSD 320-152910/3 | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26103-A-6     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26103-C-7     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26103-A-11    | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26103-D-12    | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26105-A-14    | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26079-D-4     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26079-E-6     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26079-E-7     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26079-E-8     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26095-G-1     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26105-B-1     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26105-A-2     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26105-A-3     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-152910

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/2/2017 1:45:00PM

Batch End:

|                   |               |        |        |  |
|-------------------|---------------|--------|--------|--|
| 320-26105-A-3 MS  | MS14DSP_00030 | 500 uL | 1.0 mL |  |
| 320-26105-A-3 MS  | MS14DSU_00003 | 0.5 mL | 1.0 mL |  |
| 320-26105-A-3 MSD | MS14DSP_00030 | 500 uL | 1.0 mL |  |
| 320-26105-A-3 MSD | MS14DSU_00003 | 0.5 mL | 1.0 mL |  |
| 320-26105-B-12    | MS14DSU_00003 | 0.5 mL | 1.0 mL |  |
| 320-26105-B-13    | MS14DSU_00003 | 0.5 mL | 1.0 mL |  |

| Reagent | Other Reagents: | Lot#: |
|---------|-----------------|-------|
|         | Amount/Units    |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |

Preparation Batch Number(s): 152910

Test: 8270-14DX

Earliest Holding Time: 3/2/17

| Sample List Tab                                                                                                                                     |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|--------------------------------|
| Samples identified to the correct method                                                                                                            |  | /                              | /                              |
| All necessary NCMs filed (including holding time)                                                                                                   |  | /                              | /                              |
| Method/sample/login/QAS checked and correct                                                                                                         |  | /                              | /                              |
| Worksheet Tab                                                                                                                                       |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All samples properly preserved                                                                                                                      |  | /                              | /                              |
| Weights in anticipated range and not targeted                                                                                                       |  | /                              | /                              |
| All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check) |  | /                              | /                              |
| The pH is transcribed correctly in TALS                                                                                                             |  | /                              | /                              |
| All additional information transcribed into TALS is correct and raw data is attached                                                                |  | /                              | /                              |
| Comments are transcribed correctly in TALS                                                                                                          |  | /                              | /                              |
| Reagents Tab                                                                                                                                        |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All necessary reagents not expired and entered into TALS                                                                                            |  | /                              | /                              |
| All spike amounts correct and added to necessary samples and QC                                                                                     |  | /                              | /                              |
| Batch Information                                                                                                                                   |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| Date and time accurate and entered into TALS correctly                                                                                              |  | /                              | /                              |
| All necessary 'batch information' complete and entered into TALS correctly                                                                          |  | /                              | /                              |

1<sup>st</sup> Level Reviewer: \_\_\_\_\_

Date: 3/06/17

2<sup>nd</sup> Level Reviewer: J. Williams

Date: 3/16/17

Comments: \_\_\_\_\_

# Aqueous Extraction Analysis Sheet (To Accompany Samples to Instruments)

Box 0317H

Batch Number: 320-153806

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Batch End:

## Liquid-Liquid Extraction (Separatory Funnel)

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt | InitAmt<br>FinAmt | PHS  |           | Due Date | Analytical<br>TAT | Div<br>Rank | Comments | Output Sample Lab ID |
|--------------------------------------------|----------------------|-------------------|-------------------|------|-----------|----------|-------------------|-------------|----------|----------------------|
|                                            |                      |                   |                   | Rcvd | Adj1 Adj2 |          |                   |             |          |                      |
| 1 MB-320-153806/1<br>N/A                   | N/A                  |                   | 1000 mL<br>1.0 mL | 8    |           | N/A      | N/A               | N/A         |          | MB 320-153806/1-A    |
| 2 LCS-320-153806/2<br>N/A                  | N/A                  |                   | 1000 mL<br>1.0 mL | 8    |           | N/A      | N/A               | N/A         |          | LCS 320-153806/2-A   |
| 3 LCSD-320-153806/3<br>N/A                 | N/A                  |                   | 1000 mL<br>1.0 mL | 8    |           | N/A      | N/A               | N/A         |          | LCSD 320-153806/3-A  |
| 4 320-26273-A-1<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1556.1 g          | 1.0 mL            | 6    |           | 3/6/17   | 23_Days           | 4           |          | 320-26273-A-1-A      |
| 5 320-26273-B-2<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1547.4 g          | 1.0 mL            | 7    |           | 3/6/17   | 23_Days           | 4           |          | 320-26273-B-2-A      |
| 6 320-26273-B-3<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1553.7 g          | 1.0 mL            | 4    | 7         | 3/6/17   | 23_Days           | 4           |          | 320-26273-B-3-A      |
| 7 320-26273-A-4<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1557.1 g          | 1.0 mL            | 8    |           | 3/6/17   | 23_Days           | 4           |          | 320-26273-A-4-A      |
| 8 320-26273-B-5<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1546.5 g          | 1.0 mL            | 8    |           | 3/6/17   | 23_Days           | 4           |          | 320-26273-B-5-A      |
| 9 320-26273-B-6<br>(8270_SIM_14DX)         | N/A<br>(320-26273-1) | 1555.9 g          | 1.0 mL            | 8    |           | 3/6/17   | 23_Days           | 4           |          | 320-26273-B-6-A      |
| 10 320-26324-D-5<br>(8270_SIM_14DX)        | N/A<br>(320-26324-1) | 1393.4 g          | 1.0 mL            | 8    |           | 3/9/17   | 23_Days           | 4           |          | 320-26324-D-5-A      |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Method Code: 320-3510C\_IVWT-320

Batch End:

|                                  |                      |          |        |   |        |         |   |                                                                                                      |
|----------------------------------|----------------------|----------|--------|---|--------|---------|---|------------------------------------------------------------------------------------------------------|
| 320-26324-C-6<br>(8270_SIM_14DX) | N/A<br>(320-26324-1) | 1445.1 g | 1.0 mL | 8 | 3/9/17 | 23_Days | 4 | <br>320-26324-C-6-A |
|                                  |                      |          |        |   |        |         |   |                                                                                                      |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Batch End:

| Batch Notes                          |                       |
|--------------------------------------|-----------------------|
| Person's name who did the prep       | SR/AAR 03/08/2017     |
| Prep Solvent Name                    | DCM                   |
| Prep Solvent ID                      | 0000164143            |
| Prep Solvent Volume Used             | 180                   |
| Analyst ID - Reagent Drop            |                       |
| Analyst ID - Reagent Drop Witness    |                       |
| Analyst ID - SU Reagent Drop         |                       |
| Analyst ID - SU Reagent Drop Witness |                       |
| Acid used for pH adjustment          |                       |
| Acid Used for pH Adjustment ID       |                       |
| Base used for pH adjustment          | 10N NaOH              |
| Base Used to Adjust pH ID            | 153803                |
| Silica Gel ID                        |                       |
| Analyst ID - Concentration           | CRM 3/9/17            |
| Exchange Solvent Name                |                       |
| Exchange Solvent ID                  |                       |
| Concentration Start Time             |                       |
| Concentration End Time               |                       |
| Na2SO4 ID                            | SS-00347 and SS-00348 |
| Water Bath ID                        | BT 021                |
| Uncorrected Temperature              |                       |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Method Code: 320-3510C\_IVWT-320

Batch End:

|                                    |             |
|------------------------------------|-------------|
| Oven, Bath or Block Temperature 1  | 70-75°C     |
| Sufficient volume for MS/MSD?      |             |
| Analyst ID - Clean Up              |             |
| Florisl ID                         |             |
| Acid used for Clean Up ID          |             |
| Sulfuric Acid ID                   |             |
| TBA ID                             |             |
| HPLC H2O ID                        |             |
| NaCl ID                            |             |
| Balance ID                         | QA-036      |
| Florisl Solution Reagent ID        |             |
| Mercury ID                         |             |
| Filter Paper ID                    |             |
| Pipette ID                         | K35057E     |
| Syringe ID                         |             |
| N-evap ID                          |             |
| N-evap Temperature                 |             |
| Uncorrected N-evap Temperature     |             |
| pH Paper ID                        |             |
| Thermometer ID                     |             |
| Analyst ID - Spike Analyst         | SR 03/08/17 |
| Analyst ID - Spike Witness Analyst | ACR 3/8/17  |
| Vial ID                            | 162 93 128  |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Batch End:

|               |              |
|---------------|--------------|
| Batch Comment | EU CW 3/9/17 |
|---------------|--------------|

|          |
|----------|
| Comments |
|----------|



# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Method Code: 320-3510C\_IVWT-320

Analyst: Rafieefar, Sina

Batch Open: 3/8/2017 8:41:00AM

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code  | Amount Added | Final Amount | By | Witness |
|-------------------|---------------|--------------|--------------|----|---------|
| MB 320-153806/1   | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| LCS 320-153806/2  | MS14DSP_00030 | 500 uL       | 1.0 mL       |    |         |
| LCS 320-153806/2  | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| LCSD 320-153806/3 | MS14DSP_00030 | 500 uL       | 1.0 mL       |    |         |
| LCSD 320-153806/3 | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-A-1     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-B-2     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-B-3     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-A-4     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-B-5     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26273-B-6     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26324-D-5     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |
| 320-26324-C-6     | MS14DSU_00003 | 0.5 mL       | 1.0 mL       |    |         |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-153806

Batch Open: 3/8/2017 8:41:00AM

Analyst: Rafieefar, Sina

Method Code: 320-3510C\_IVWT-320

Batch End:

| Reagent | Other Reagents: |  | Lot#: |
|---------|-----------------|--|-------|
|         | Amount/Units    |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |

Preparation Batch Number(s): 153806

Test: 14DX

Earliest Holding Time: 3/8/17

|                                                                                                                                                     | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|
| <b>Sample List Tab</b>                                                                                                                              |                                |                                |
| Samples identified to the correct method                                                                                                            | ✓                              | ✓                              |
| All necessary NCMs filed (including holding time)                                                                                                   | ✓                              | ✓                              |
| Method/sample/login/QAS checked and correct                                                                                                         | ✓                              | ✓                              |
| <b>Worksheet Tab</b>                                                                                                                                |                                |                                |
| All samples properly preserved                                                                                                                      | ✓                              | ✓                              |
| Weights in anticipated range and not targeted                                                                                                       | ✓                              | ✓                              |
| All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check) | ✓                              | ✓                              |
| The pH is transcribed correctly in TALS                                                                                                             | ✓                              | ✓                              |
| All additional information transcribed into TALS is correct and raw data is attached                                                                | ✓                              | ✓                              |
| Comments are transcribed correctly in TALS                                                                                                          | ✓                              | ✓                              |
| <b>Reagents Tab</b>                                                                                                                                 |                                |                                |
| All necessary reagents not expired and entered into TALS                                                                                            | ✓                              | ✓                              |
| All spike amounts correct and added to necessary samples and QC                                                                                     | ✓                              | ✓                              |
| <b>Batch Information</b>                                                                                                                            |                                |                                |
| Date and time accurate and entered into TALS correctly                                                                                              | ✓                              | ✓                              |
| All necessary 'batch information' complete and entered into TALS correctly                                                                          | ✓                              | ✓                              |

1<sup>st</sup> Level Reviewer: CRM

Date: 3/9/17

2<sup>nd</sup> Level Reviewer: J. P. Hunt

Date: 3/9/17

Comments: \_\_\_\_\_

# Method PFC DOD

---

Perfluronated Hydrocarbons (LC/MS)  
by Method PFC\_DOD

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Matrix: Water Level: Low

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

| Client Sample ID             | Lab Sample ID         | PFHxS # | PFOA # | PFOS # |
|------------------------------|-----------------------|---------|--------|--------|
| MEAFF-4DMW01-0317            | 320-26324-1           | 91      | 67     | 90     |
| MEAFF-4DMW03-0317            | 320-26324-2           | 83      | 69     | 76     |
| MEAFF-4DMW03-0317<br>DL      | 320-26324-2 DL        | 113     | 93     | 100    |
| MEAFF-4BMW02-0317            | 320-26324-3           | 102     | 38     | 93     |
| MEAFF-4BMW03-0317            | 320-26324-4           | 97      | 37     | 89     |
| MEAFF-EB03-GW-0317           | 320-26324-5           | 99      | 106    | 90     |
| MEAFF-EB04-GW-0317           | 320-26324-6           | 95      | 101    | 90     |
|                              | MB<br>320-154076/1-A  | 95      | 105    | 88     |
|                              | LCS<br>320-154076/2-A | 95      | 100    | 91     |
| MEAFF-4BMW02-0317-<br>MS MS  | 320-26324-3 MS        | 100     | 40     | 91     |
| MEAFF-4BMW02-0317-<br>SD MSD | 320-26324-3 MSD       | 96      | 49     | 90     |

|                    |                  |
|--------------------|------------------|
|                    | <u>QC LIMITS</u> |
| PFHxS = 1802 PFHxS | 25-150           |
| PFOA = 13C4 PFOA   | 25-150           |
| PFOS = 13C4 PFOS   | 25-150           |

# Column to be used to flag recovery values

FORM II 537 (Modified)

FORM III  
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.03.11D\_065.d  
 Lab ID: LCS 320-154076/2-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 | # |
|-------------------------------------|--------------------------|--------------------------------|-----------------|---------------------|---|
| Perfluorooctanoic acid (PFOA)       | 40.0                     | 45.1                           | 113             | 60-140              |   |
| Perfluorooctanesulfonic acid (PFOS) | 37.1                     | 42.1                           | 113             | 60-140              | M |
| 13C4 PFOA                           | 97.9                     | 98.2                           | 100             | 25-150              |   |
| 13C4 PFOS                           | 93.6                     | 84.8                           | 91              | 25-150              |   |
| Perfluorobutanesulfonic acid (PFBS) | 35.4                     | 44.5                           | 126             | 50-150              |   |
| 18O2 PFHxS                          | 92.6                     | 87.9                           | 95              | 25-150              |   |

# Column to be used to flag recovery and RPD values  
 FORM III 537 (Modified)

FORM III  
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.03.11D\_069.d  
 Lab ID: 320-26324-3 MS Client ID: MEAFF-4BMW02-0317-MS 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 | # |
|-------------------------------------|--------------------------|-----------------------------------|-------------------------------|----------------|---------------------|---|
| Perfluorooctanoic acid (PFOA)       | 37.4                     | 1.9 U                             | 41.0                          | 109            | 60-140              |   |
| Perfluorooctanesulfonic acid (PFOS) | 34.7                     | 2.8 U                             | 40.3                          | 116            | 60-140              | M |
| 13C4 PFOA                           | 91.6                     | 35                                | 36.7                          | 40             | 25-150              |   |
| 13C4 PFOS                           | 87.5                     | 82                                | 79.7                          | 91             | 25-150              |   |
| Perfluorobutanesulfonic acid (PFBS) | 33.1                     | 1.9 U                             | 38.8                          | 117            | 50-150              |   |
| 18O2 PFHxS                          | 86.6                     | 89                                | 86.5                          | 100            | 25-150              |   |

# Column to be used to flag recovery and RPD values  
 FORM III 537 (Modified)

FORM III  
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2017.03.11D\_070.d  
 Lab ID: 320-26324-3 MSD Client ID: MEAFF-4BMW02-0317-SD MSD

| COMPOUND                            | SPIKE<br>ADDED<br>(ng/L) | MSD<br>CONCENTRATION<br>(ng/L) | MSD<br>%<br>REC | %<br>RPD | QC LIMITS |        | # |
|-------------------------------------|--------------------------|--------------------------------|-----------------|----------|-----------|--------|---|
|                                     |                          |                                |                 |          | RPD       | REC    |   |
| Perfluorooctanoic acid (PFOA)       | 37.2                     | 40.4                           | 109             | 1        | 30        | 60-140 |   |
| Perfluorooctanesulfonic acid (PFOS) | 34.6                     | 39.8                           | 115             | 1        | 30        | 60-140 | M |
| 13C4 PFOA                           | 91.2                     | 45.0                           | 49              |          |           | 25-150 |   |
| 13C4 PFOS                           | 87.1                     | 78.7                           | 90              |          |           | 25-150 |   |
| Perfluorobutanesulfonic acid (PFBS) | 32.9                     | 41.2                           | 125             | 6        | 30        | 50-150 |   |
| 18O2 PFHxS                          | 86.2                     | 82.7                           | 96              |          |           | 25-150 |   |

# Column to be used to flag recovery and RPD values  
 FORM III 537 (Modified)



FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2017.03.11D\_064.d Lab Sample ID: MB 320-154076/1-A  
 Matrix: Water Date Extracted: 03/09/2017 10:15  
 Instrument ID: A8\_N Date Analyzed: 03/12/2017 03:28  
 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 320-154076/2-A | 2017.03.11D<br>065.d | 03/12/2017 03:35 |
| MEAFF-4DMW01-0317        | 320-26324-1        | 2017.03.11D<br>066.d | 03/12/2017 03:43 |
| MEAFF-4DMW03-0317        | 320-26324-2        | 2017.03.11D<br>067.d | 03/12/2017 03:50 |
| MEAFF-4BMW02-0317        | 320-26324-3        | 2017.03.11D<br>068.d | 03/12/2017 03:58 |
| MEAFF-4BMW02-0317-MS MS  | 320-26324-3 MS     | 2017.03.11D<br>069.d | 03/12/2017 04:05 |
| MEAFF-4BMW02-0317-SD MSD | 320-26324-3 MSD    | 2017.03.11D<br>070.d | 03/12/2017 04:13 |
| MEAFF-4BMW03-0317        | 320-26324-4        | 2017.03.11D<br>071.d | 03/12/2017 04:20 |
| MEAFF-EB03-GW-0317       | 320-26324-5        | 2017.03.11D<br>072.d | 03/12/2017 04:28 |
| MEAFF-EB04-GW-0317       | 320-26324-6        | 2017.03.11D<br>073.d | 03/12/2017 04:35 |
| MEAFF-4DMW03-0317 DL     | 320-26324-2 DL     | 2017.03.15D<br>025.d | 03/15/2017 20:16 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4DMW01-0317 Lab Sample ID: 320-26324-1  
 Matrix: Water Lab File ID: 2017.03.11D\_066.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 10:00  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 255 (mL) Date Analyzed: 03/12/2017 03:43  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 220    | M | 2.5 | 2.0 | 0.73 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 210    | M | 3.9 | 2.9 | 1.3  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 11     |   | 2.5 | 2.0 | 0.90 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 67   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 91   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_066.d  
 Lims ID: 320-26324-A-1-A  
 Client ID: MEAFF-4DMW01-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 03:43:06 ALS Bottle#: 3 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-1-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:25:18 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK006

First Level Reviewer: chandrasenas

Date: 27-Mar-2017 13:47:53

| Signal                           | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|----------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 5 Perfluorobutanesulfonic acid   |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                   | 1.861 | 1.861  | 0.0    | 1.000  | 2147944  | 5.69         |                 |      |        |       |
| 298.90 > 99.00                   | 1.861 | 1.861  | 0.0    | 1.000  | 869708   |              | 2.47(0.00-0.00) |      |        |       |
| D 11 18O2 PFHxS                  |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                   | 2.471 | 2.463  | 0.008  |        | 12197858 | 41.9         |                 | 90.5 | 445378 |       |
| 15 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                  | 2.829 | 2.812  | 0.017  | 1.000  | 16070783 | 114.1        |                 |      | 189624 | M     |
| 413.00 > 169.00                  | 2.821 | 2.812  | 0.009  | 0.997  | 10352601 |              | 1.55(0.90-1.10) |      | 208337 | M     |
| D 14 13C4 PFOA                   |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                  | 2.821 | 2.812  | 0.009  |        | 6749492  | 32.9         |                 | 67.3 | 218704 |       |
| 17 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                   | 3.074 | 3.186  | -0.112 | 1.000  | 22525347 | 105.8        |                 |      | 212114 | M     |
| 499.00 > 99.00                   | 3.186 | 3.186  | 0.0    | 1.037  | 3557670  |              | 6.33(0.90-1.10) |      | 67688  | M     |
| D 18 13C4 PFOS                   |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                   | 3.186 | 3.194  | -0.008 |        | 10133729 | 41.9         |                 | 89.6 | 207823 |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_066.d

Injection Date: 12-Mar-2017 03:43:06

Instrument ID: A8\_N

Lims ID: 320-26324-A-1-A

Lab Sample ID: 320-26324-1

Client ID: MEAFF-4DMW01-0317

Operator ID: A8-PC\A8

ALS Bottle#: 3

Worklist Smp#: 4

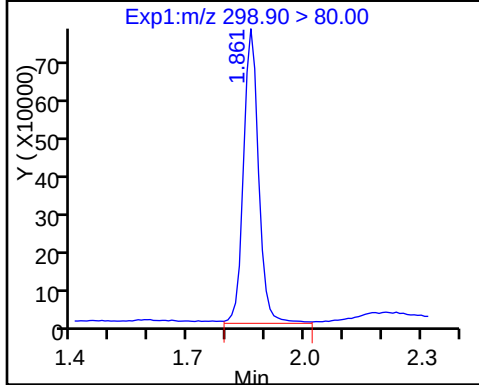
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

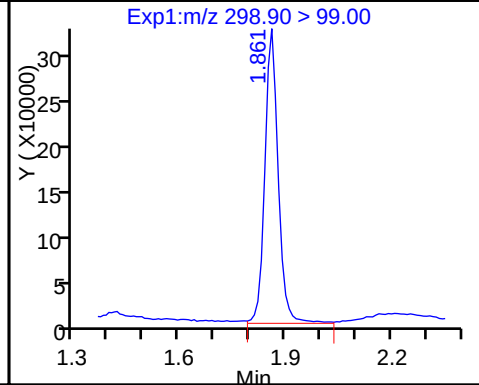
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

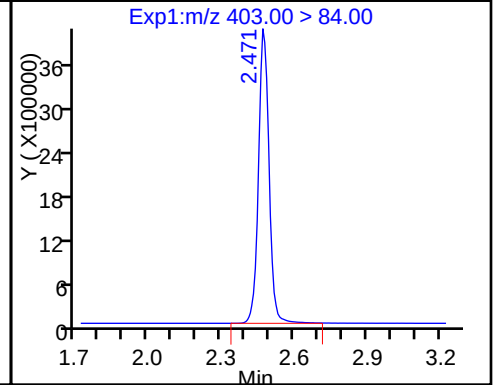
5 Perfluorobutanesulfonic acid



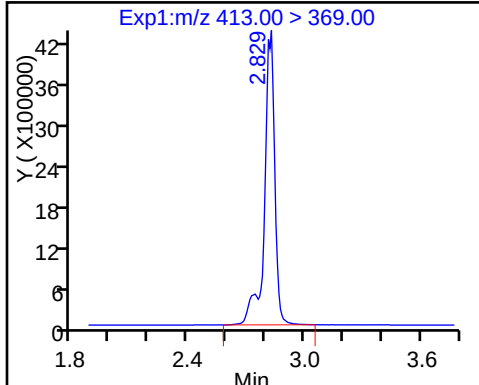
5 Perfluorobutanesulfonic acid



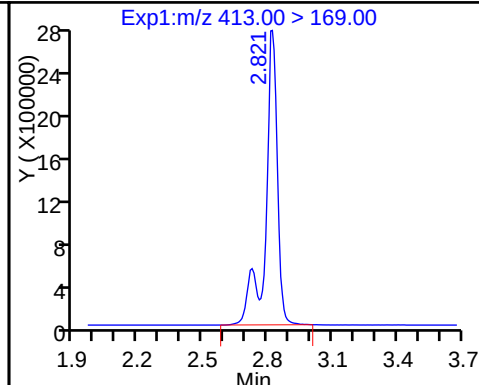
D 11 18O2 PFHxS



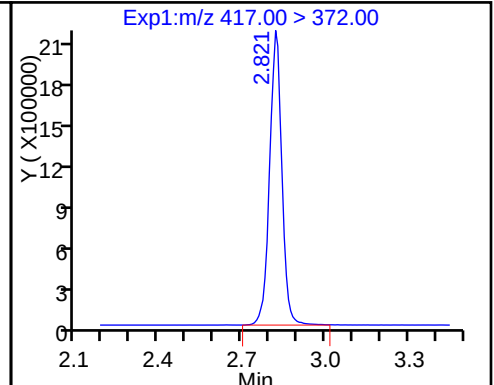
15 Perfluorooctanoic acid (M)



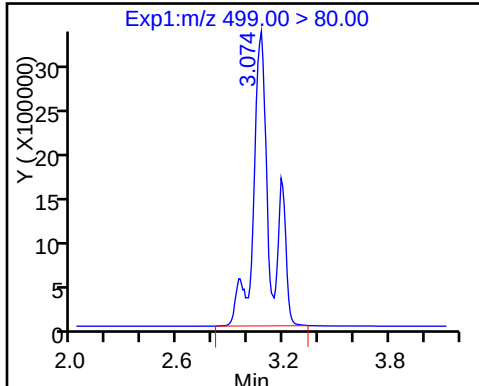
15 Perfluorooctanoic acid (M)



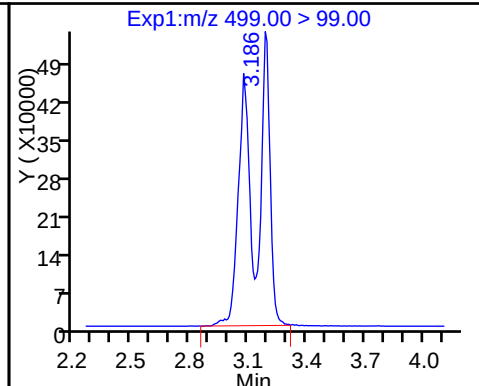
D 14 13C4 PFOA



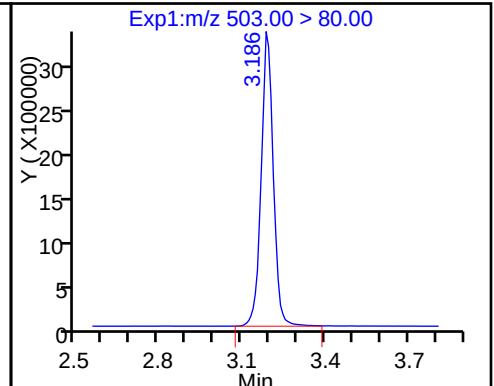
17 Perfluorooctane sulfonic acid (M)



17 Perfluorooctane sulfonic acid (M)



D 18 13C4 PFOS



## TestAmerica Sacramento

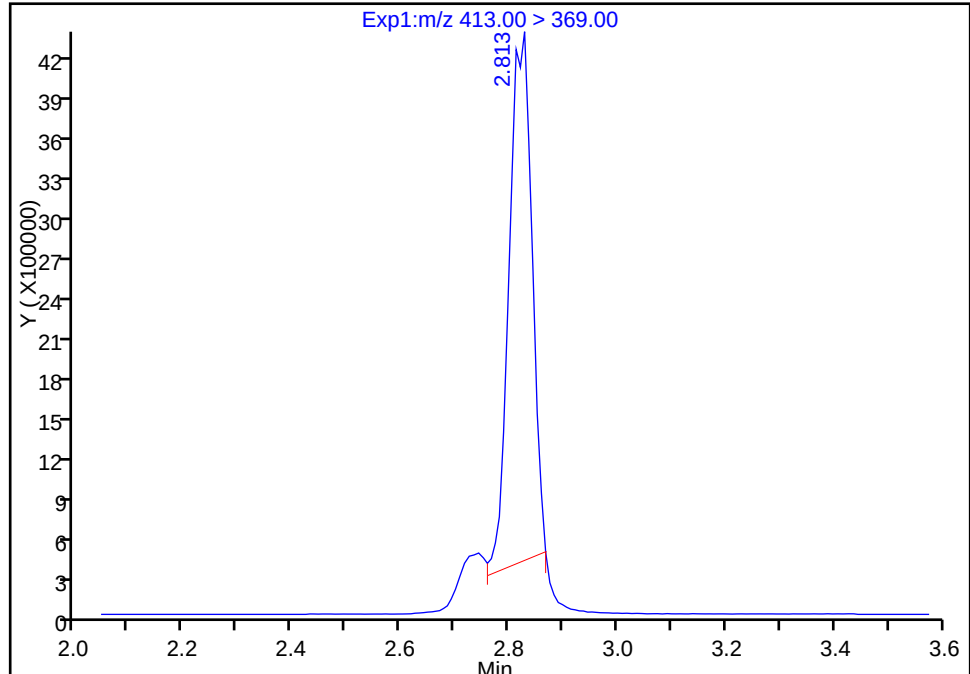
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_066.d  
Injection Date: 12-Mar-2017 03:43:06 Instrument ID: A8\_N  
Lims ID: 320-26324-A-1-A Lab Sample ID: 320-26324-1  
Client ID: MEAFF-4DMW01-0317  
Operator ID: A8-PC\A8 ALS Bottle#: 3 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

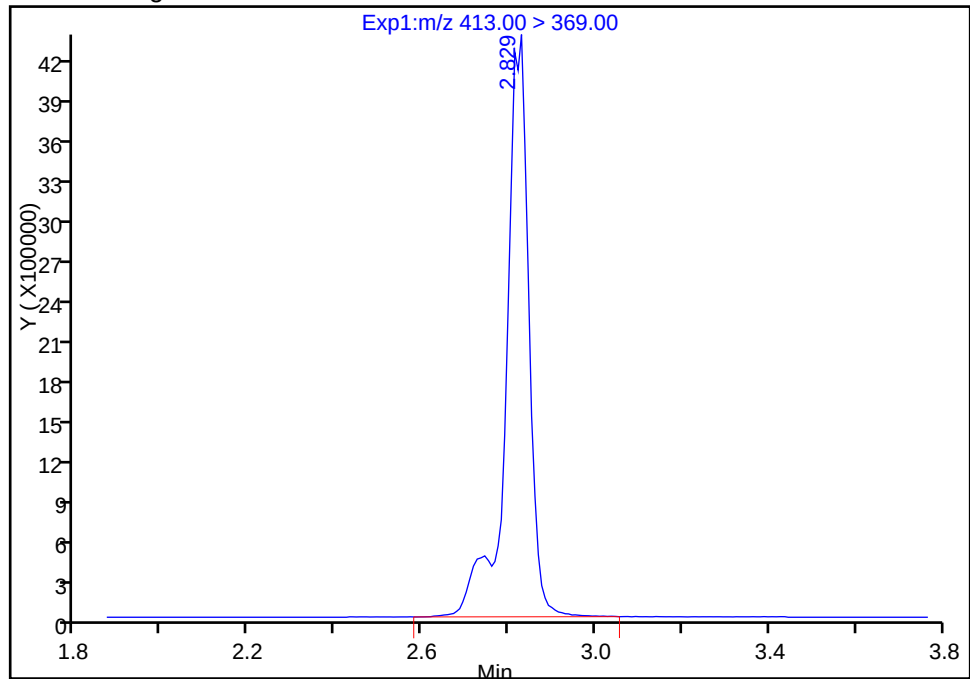
RT: 2.81  
Area: 11618965  
Amount: 82.480757  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.83  
Area: 16070783  
Amount: 114.0833  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:39

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

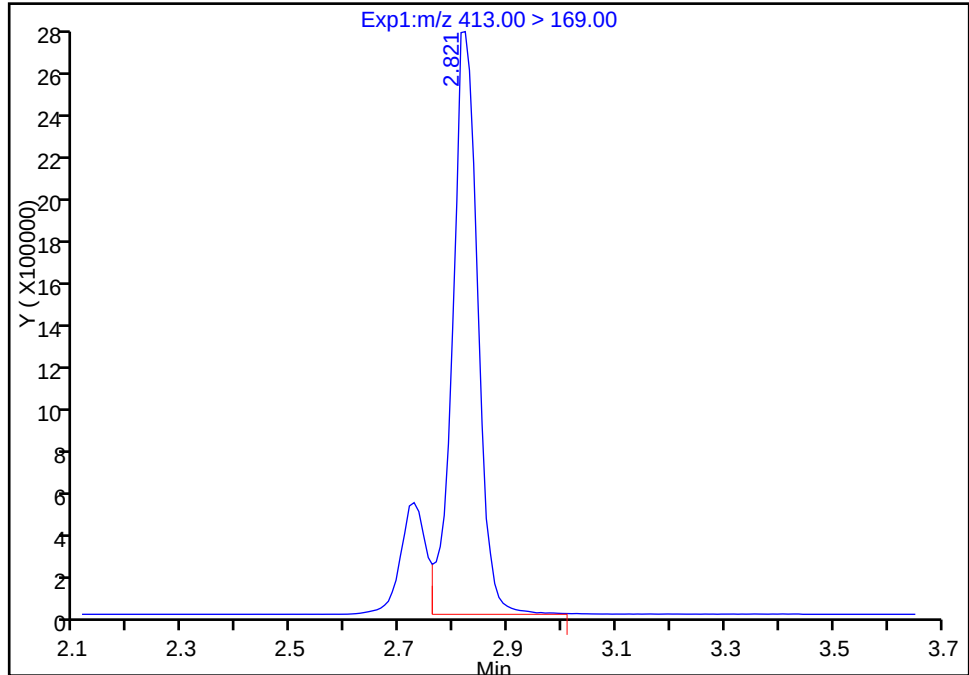
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_066.d  
Injection Date: 12-Mar-2017 03:43:06 Instrument ID: A8\_N  
Lims ID: 320-26324-A-1-A Lab Sample ID: 320-26324-1  
Client ID: MEAFF-4DMW01-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 3 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

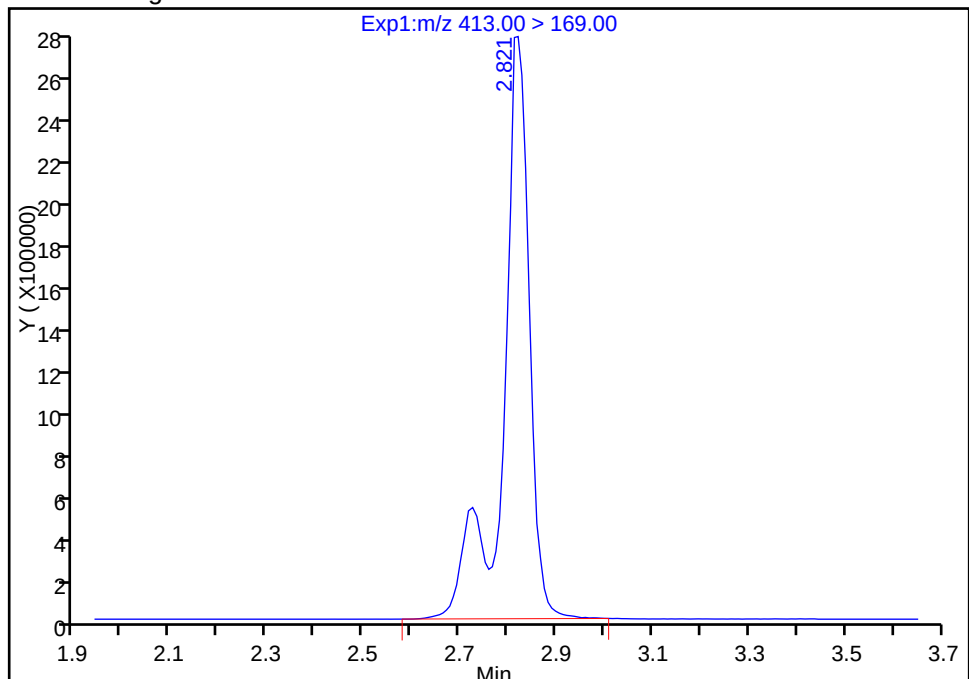
RT: 2.82  
Area: 8726394  
Amount: 82.480757  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.82  
Area: 10352601  
Amount: 114.0833  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:39

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

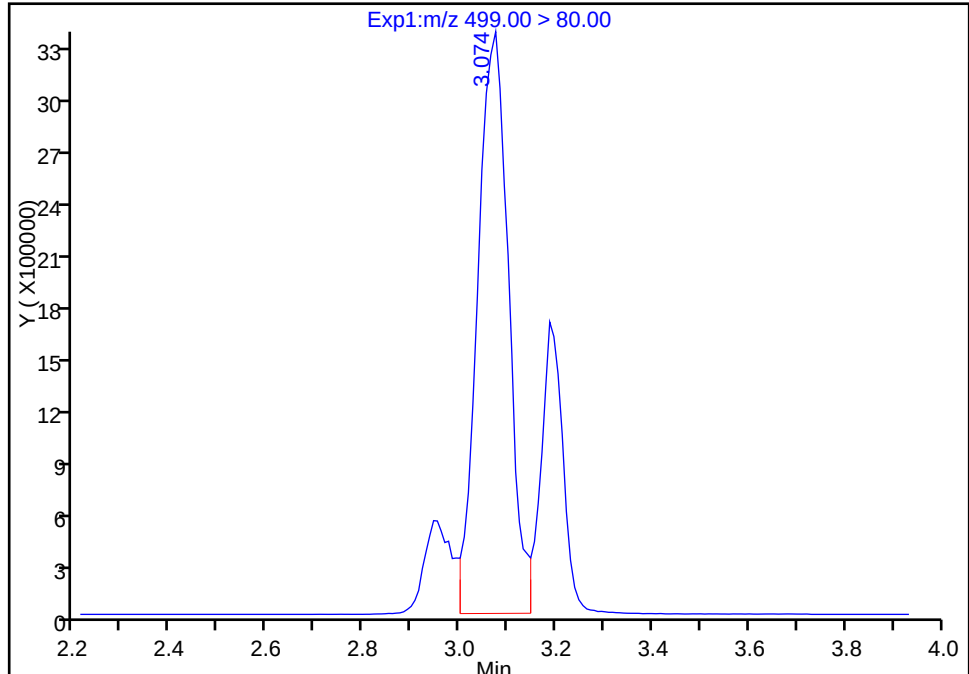
|                 |                                                                        |                |                 |                |   |
|-----------------|------------------------------------------------------------------------|----------------|-----------------|----------------|---|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20170312-40742.b\2017.03.11D_066.d |                |                 |                |   |
| Injection Date: | 12-Mar-2017 03:43:06                                                   | Instrument ID: | A8_N            |                |   |
| Lims ID:        | 320-26324-A-1-A                                                        | Lab Sample ID: | 320-26324-1     |                |   |
| Client ID:      | MEAFF-4DMW01-0317                                                      |                |                 |                |   |
| Operator ID:    | A8-PC\A8                                                               | ALS Bottle#:   | 3               | Worklist Smp#: | 4 |
| Injection Vol:  | 2.0 ul                                                                 | Dil. Factor:   | 1.0000          |                |   |
| Method:         | A8_N                                                                   | Limit Group:   | LC PFC_DOD ICAL |                |   |
| Column:         |                                                                        | Detector       | EXP1            |                |   |

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

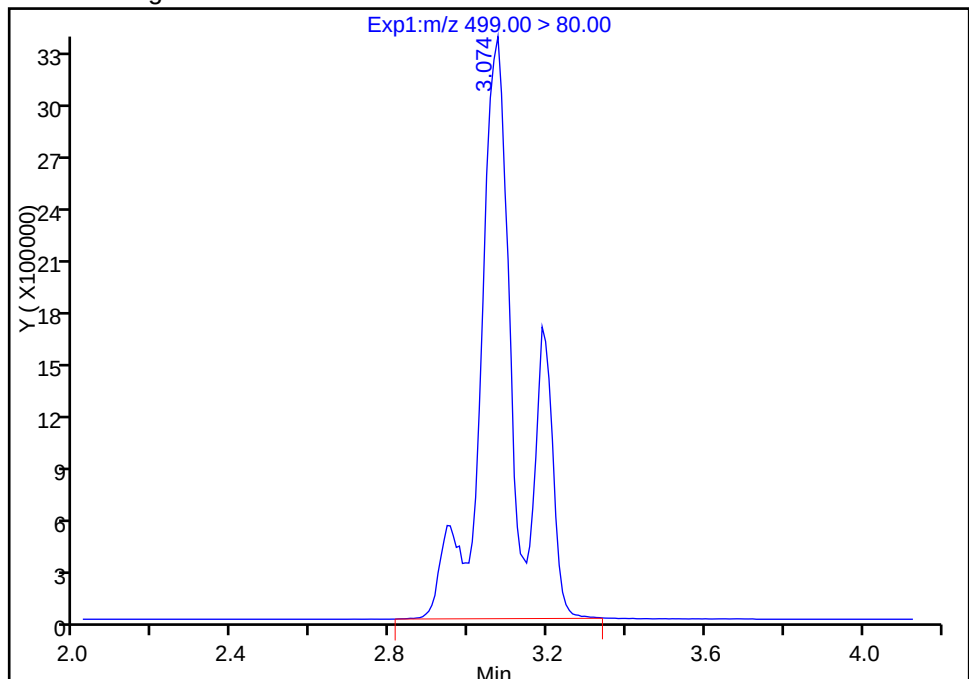
RT: 3.07  
Area: 15035780  
Amount: 70.600866  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.07  
Area: 22525347  
Amount: 105.7683  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:39

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

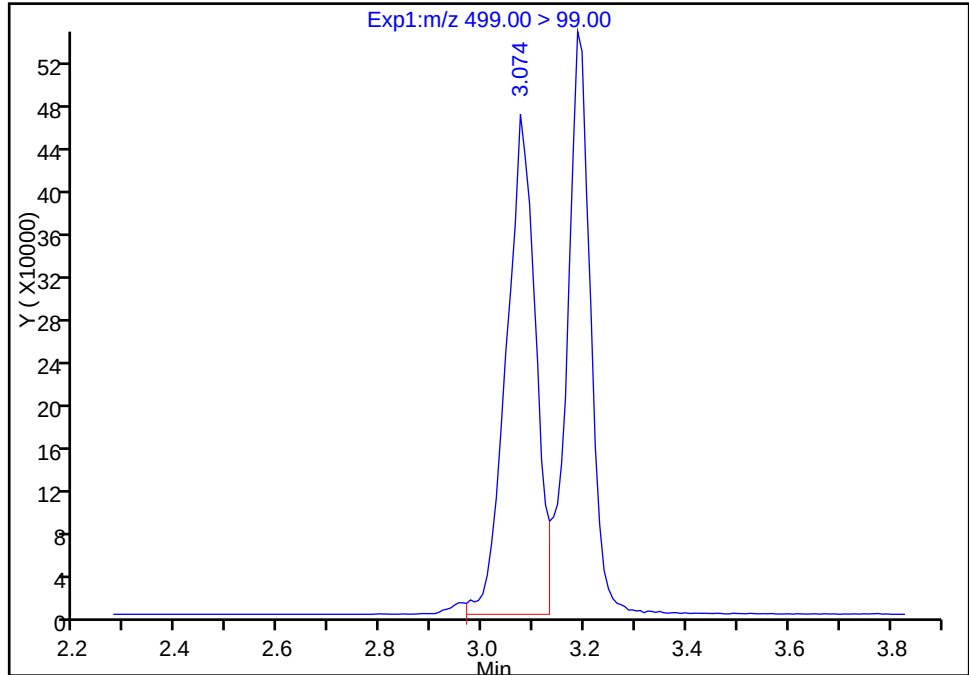
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_066.d  
Injection Date: 12-Mar-2017 03:43:06 Instrument ID: A8\_N  
Lims ID: 320-26324-A-1-A Lab Sample ID: 320-26324-1  
Client ID: MEAFF-4DMW01-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 3 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

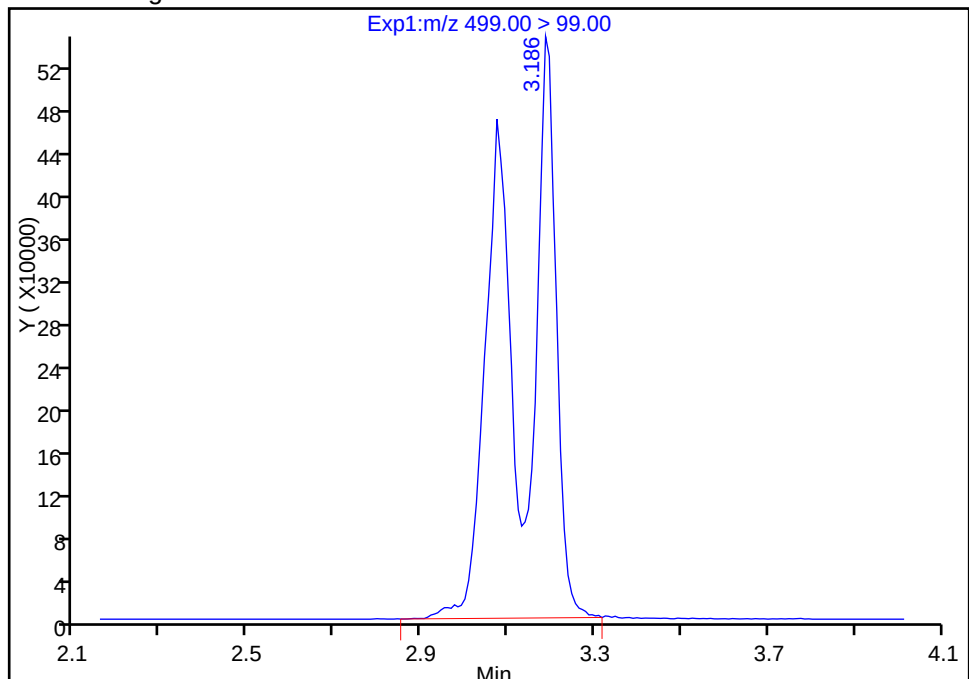
RT: 3.07  
Area: 1837696  
Amount: 70.600866  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 3557670  
Amount: 105.7683  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:39

Audit Action: Manually Integrated

Audit Reason: Isomers



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                            |                                                     |
|--------------------------------------------|-----------------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>    | Job No.: <u>320-26324-1</u>                         |
| SDG No.: _____                             |                                                     |
| Client Sample ID: <u>MEAFF-4DMW03-0317</u> | Lab Sample ID: <u>320-26324-2</u>                   |
| Matrix: <u>Water</u>                       | Lab File ID: <u>2017.03.11D_067.d</u>               |
| Analysis Method: <u>537 (Modified)</u>     | Date Collected: <u>03/03/2017 10:50</u>             |
| Extraction Method: <u>3535</u>             | Date Extracted: <u>03/09/2017 10:15</u>             |
| Sample wt/vol: <u>260.1 (mL)</u>           | Date Analyzed: <u>03/12/2017 03:50</u>              |
| Con. Extract Vol.: <u>0.5 (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>154520</u>          | Units: <u>ng/L</u>                                  |

| CAS NO.   | COMPOUND NAME                       | RESULT | Q   | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|-----|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 360    | M   | 2.4 | 1.9 | 0.72 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 1100   | M E | 3.8 | 2.9 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 15     | M   | 2.4 | 1.9 | 0.88 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 69   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 76   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 83   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_067.d  
 Lims ID: 320-26324-A-2-A  
 Client ID: MEAFF-4DMW03-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 03:50:36 ALS Bottle#: 4 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-2-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 27-Mar-2017 13:48:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK006

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:08:53

| Signal                           | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|----------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 5 Perfluorobutanesulfonic acid   |       |        |        |        |          |              |                 |      |        | M     |
| 298.90 > 80.00                   | 1.865 | 1.861  | 0.004  | 1.000  | 2641641  | 7.66         |                 |      |        |       |
| 298.90 > 99.00                   | 1.865 | 1.861  | 0.004  | 1.000  | 1066216  |              | 2.48(0.00-0.00) |      |        | M     |
| D 11 18O2 PFHxS                  |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                   | 2.483 | 2.463  | 0.020  |        | 11143168 | 38.3         |                 | 82.7 | 355970 |       |
| 15 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 413.00 > 369.00                  | 2.825 | 2.812  | 0.013  | 1.000  | 27133193 | 187.7        |                 |      | 126215 | M     |
| 413.00 > 169.00                  | 2.825 | 2.812  | 0.013  | 1.000  | 18334692 |              | 1.48(0.90-1.10) |      | 324859 | M     |
| D 14 13C4 PFOA                   |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                  | 2.825 | 2.812  | 0.013  |        | 6927952  | 33.8         |                 | 69.1 | 210902 |       |
| 17 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |        | EM    |
| 499.00 > 80.00                   | 3.079 | 3.186  | -0.107 | 1.000  | 98886453 | 547.7        |                 |      | 340734 | EM    |
| 499.00 > 99.00                   | 3.193 | 3.186  | 0.006  | 1.037  | 20011152 |              | 4.94(0.90-1.10) |      | 154797 | M     |
| D 18 13C4 PFOS                   |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                   | 3.193 | 3.194  | -0.002 |        | 8591036  | 35.6         |                 | 76.0 | 91491  |       |

### QC Flag Legend

#### Processing Flags

E - Exceeded Maximum Amount

#### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_067.d

Injection Date: 12-Mar-2017 03:50:36

Instrument ID: A8\_N

Lims ID: 320-26324-A-2-A

Lab Sample ID: 320-26324-2

Client ID: MEAFF-4DMW03-0317

Operator ID: A8-PC\A8

ALS Bottle#: 4

Worklist Smp#: 5

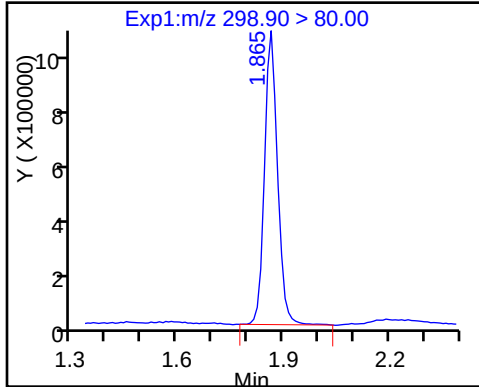
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

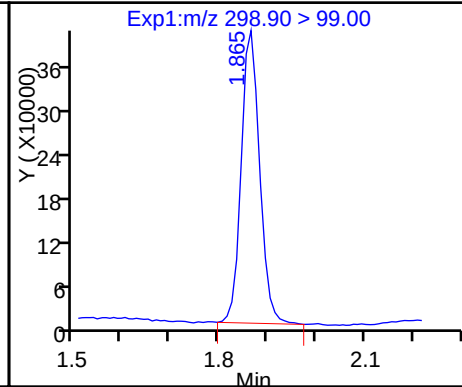
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

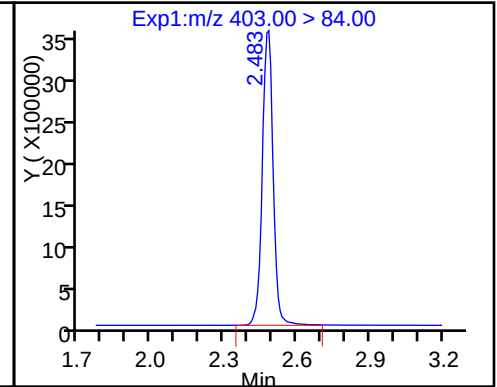
5 Perfluorobutanesulfonic acid



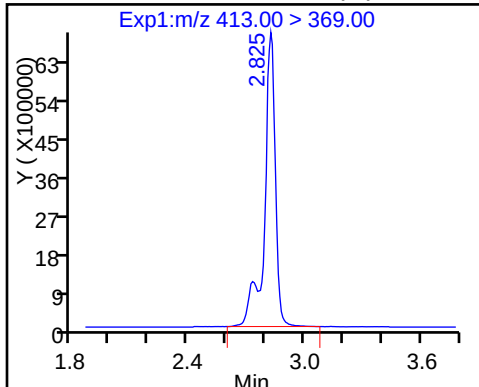
5 Perfluorobutanesulfonic acid (M)



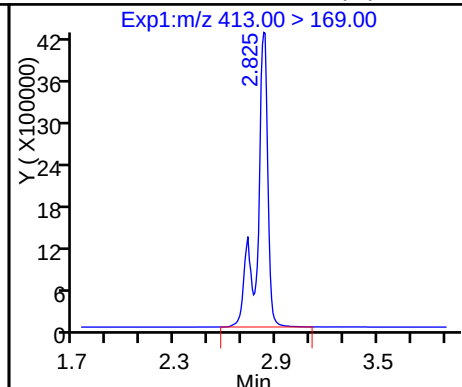
D 11 18O2 PFHxS



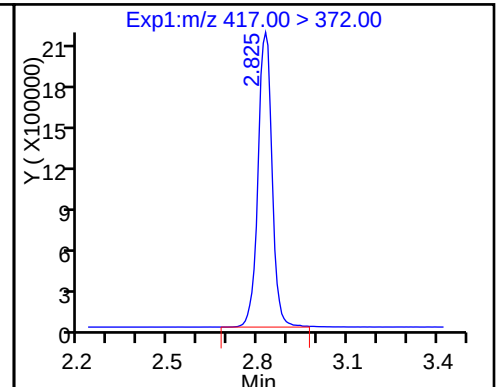
15 Perfluorooctanoic acid (M)



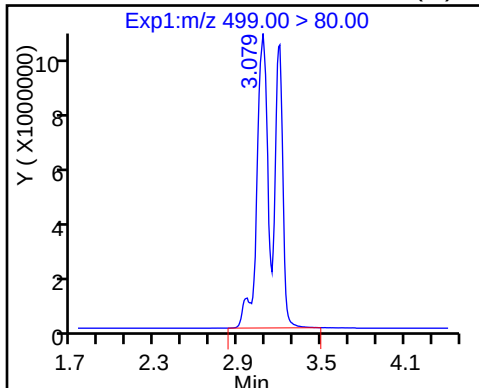
15 Perfluorooctanoic acid (M)



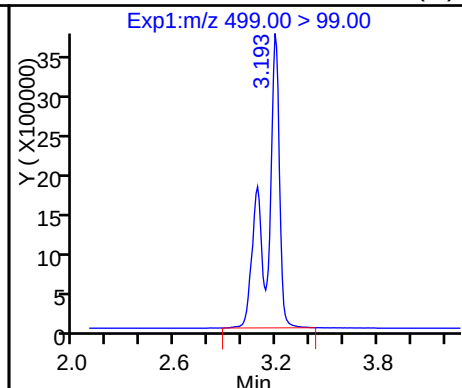
D 14 13C4 PFOA



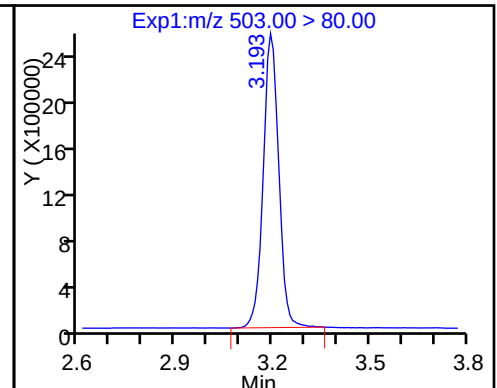
17 Perfluorooctane sulfonic acid (M)



17 Perfluorooctane sulfonic acid (M)



D 18 13C4 PFOS



## TestAmerica Sacramento

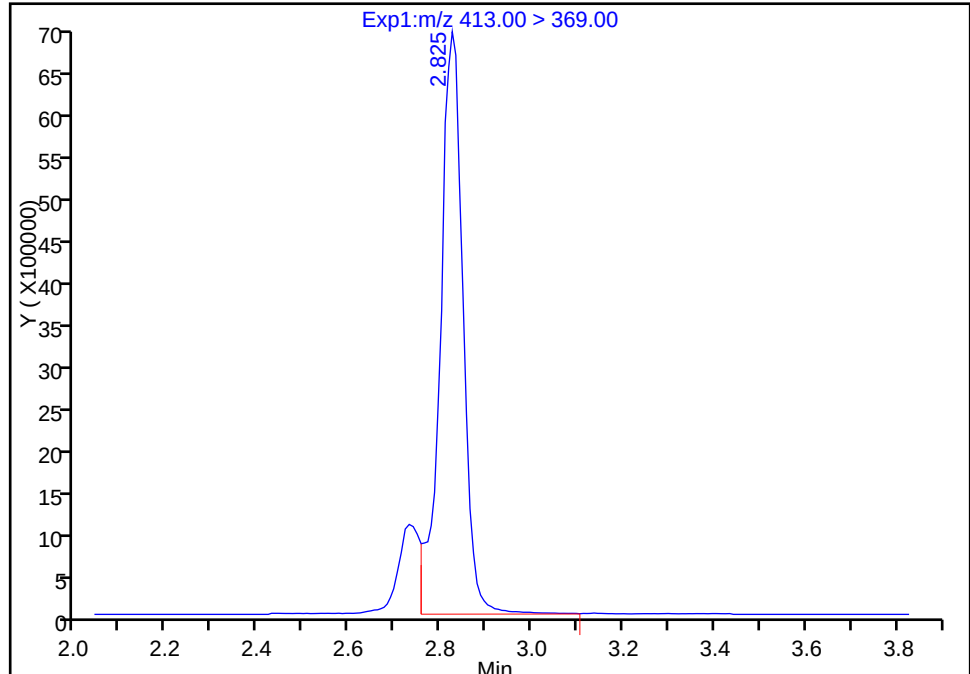
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_067.d  
Injection Date: 12-Mar-2017 03:50:36 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PC\A8 ALS Bottle#: 4 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

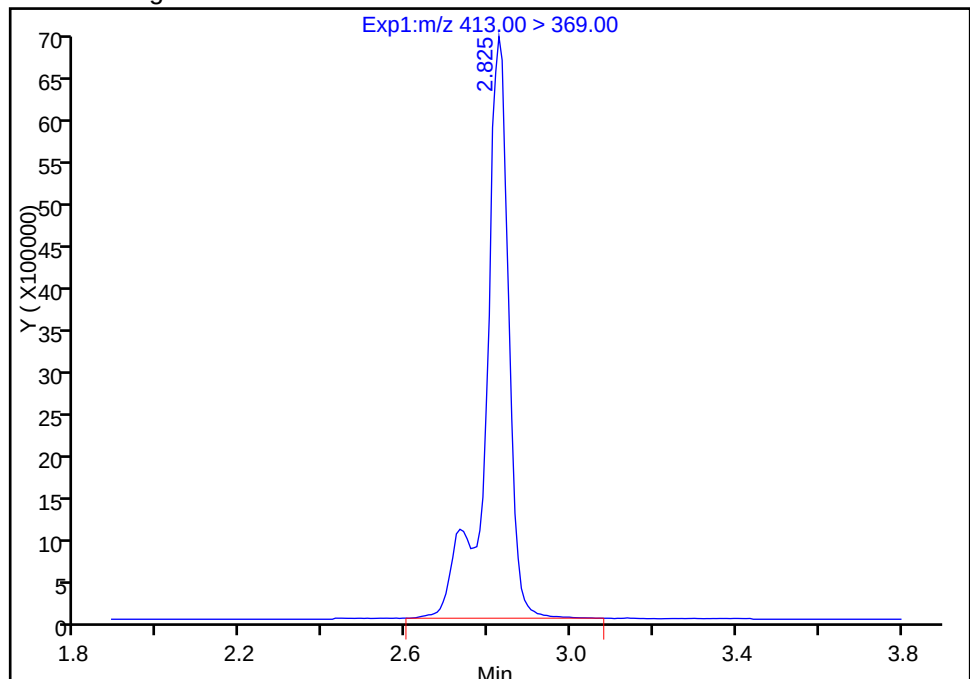
RT: 2.83  
Area: 23995797  
Amount: 165.9536  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.83  
Area: 27133193  
Amount: 187.6516  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:57

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

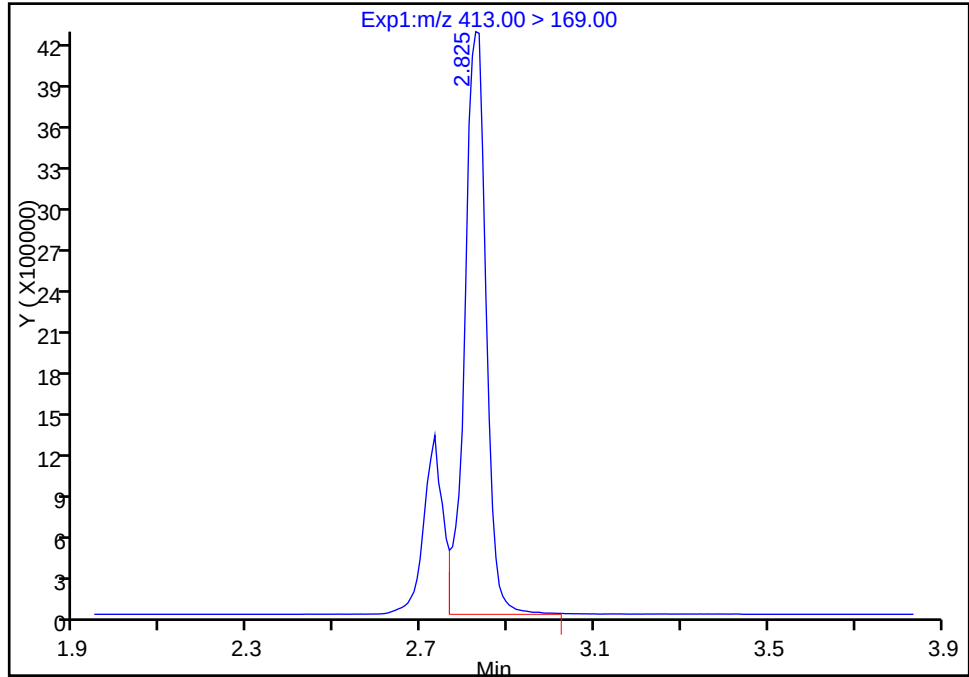
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_067.d  
Injection Date: 12-Mar-2017 03:50:36 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 4 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

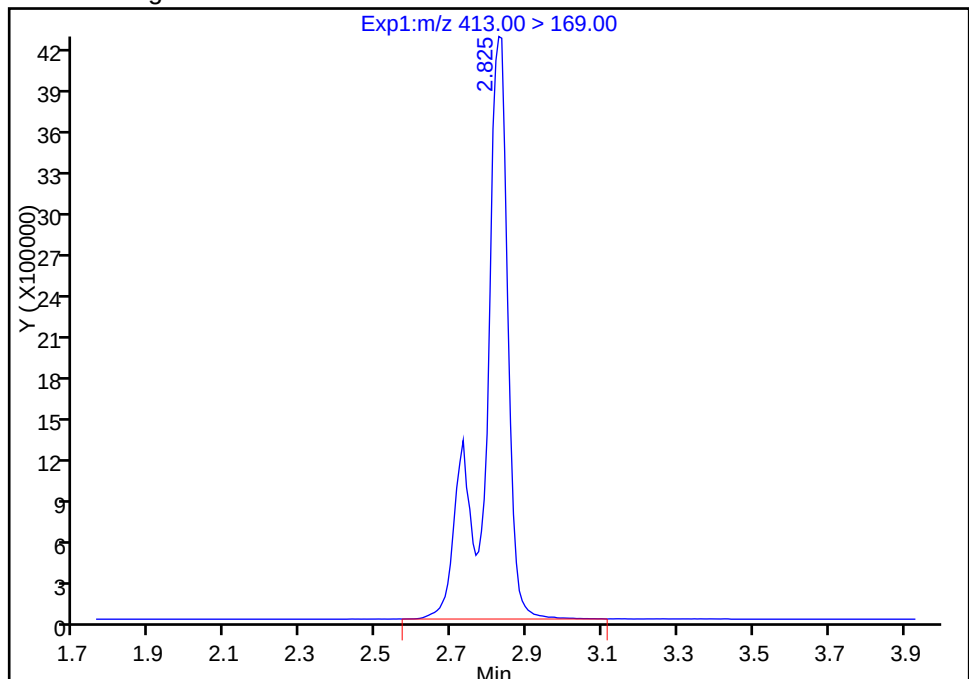
RT: 2.83  
Area: 14424301  
Amount: 165.9536  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.83  
Area: 18334692  
Amount: 187.6516  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:57

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

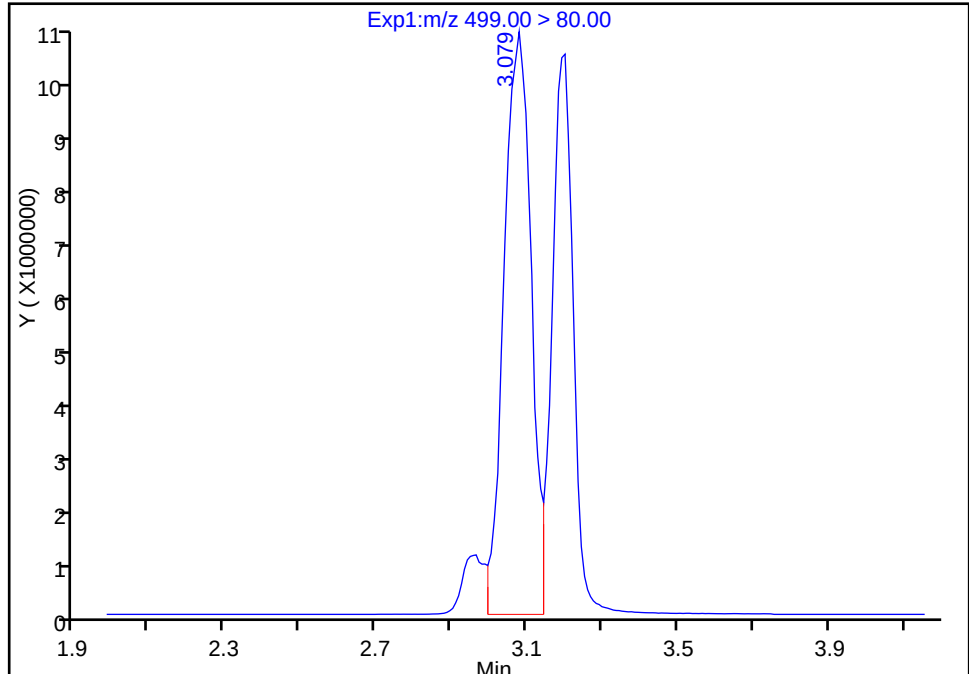
|                 |                                                                        |                |                 |                |   |
|-----------------|------------------------------------------------------------------------|----------------|-----------------|----------------|---|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20170312-40742.b\2017.03.11D_067.d |                |                 |                |   |
| Injection Date: | 12-Mar-2017 03:50:36                                                   | Instrument ID: | A8_N            |                |   |
| Lims ID:        | 320-26324-A-2-A                                                        | Lab Sample ID: | 320-26324-2     |                |   |
| Client ID:      | MEAFF-4DMW03-0317                                                      |                |                 |                |   |
| Operator ID:    | A8-PC\A8                                                               | ALS Bottle#:   | 4               | Worklist Smp#: | 5 |
| Injection Vol:  | 2.0 ul                                                                 | Dil. Factor:   | 1.0000          |                |   |
| Method:         | A8_N                                                                   | Limit Group:   | LC PFC_DOD ICAL |                |   |
| Column:         |                                                                        | Detector       | EXP1            |                |   |

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

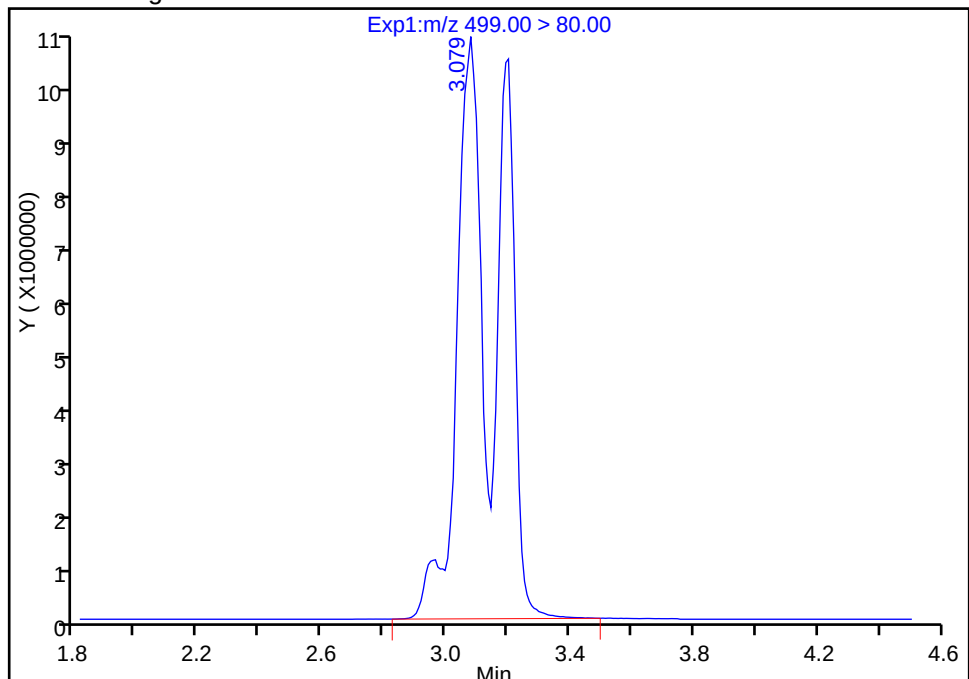
RT: 3.08  
Area: 54227747  
Amount: 300.3512  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.08  
Area: 98886453  
Amount: 547.7024  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:57

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

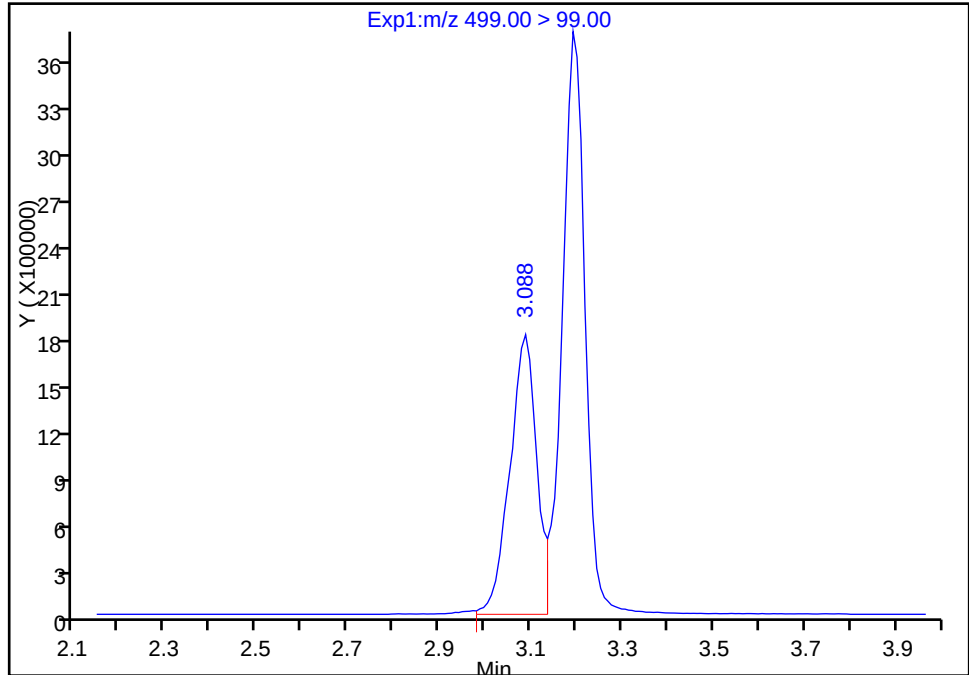
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_067.d  
Injection Date: 12-Mar-2017 03:50:36 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 4 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

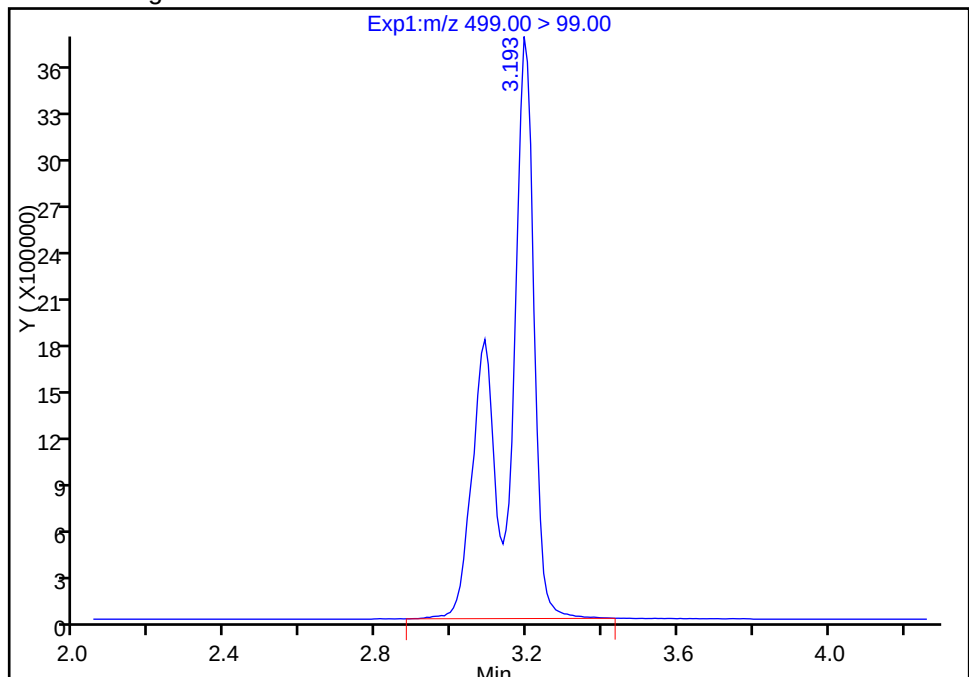
RT: 3.09  
Area: 7245447  
Amount: 300.3512  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 20011152  
Amount: 547.7024  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 27-Mar-2017 13:47:57

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

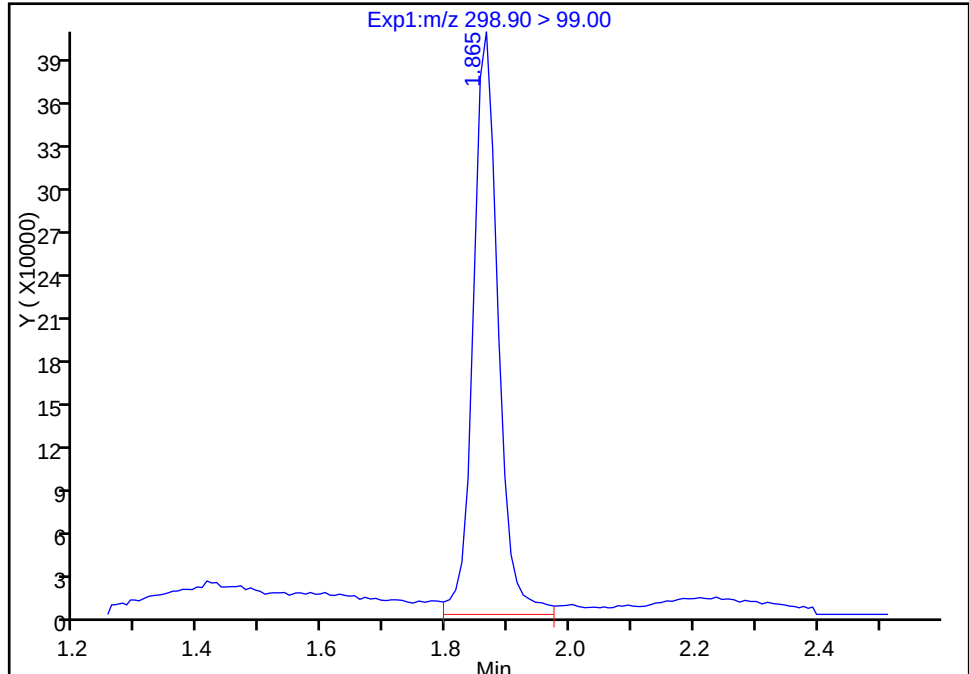
|                 |                                                                        |                |                 |                |   |
|-----------------|------------------------------------------------------------------------|----------------|-----------------|----------------|---|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20170312-40742.b\2017.03.11D_067.d |                |                 |                |   |
| Injection Date: | 12-Mar-2017 03:50:36                                                   | Instrument ID: | A8_N            |                |   |
| Lims ID:        | 320-26324-A-2-A                                                        | Lab Sample ID: | 320-26324-2     |                |   |
| Client ID:      | MEAFF-4DMW03-0317                                                      |                |                 |                |   |
| Operator ID:    | A8-PC\A8                                                               | ALS Bottle#:   | 4               | Worklist Smp#: | 5 |
| Injection Vol:  | 2.0 ul                                                                 | Dil. Factor:   | 1.0000          |                |   |
| Method:         | A8_N                                                                   | Limit Group:   | LC PFC_DOD ICAL |                |   |
| Column:         |                                                                        | Detector       | EXP1            |                |   |

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

Signal: 2

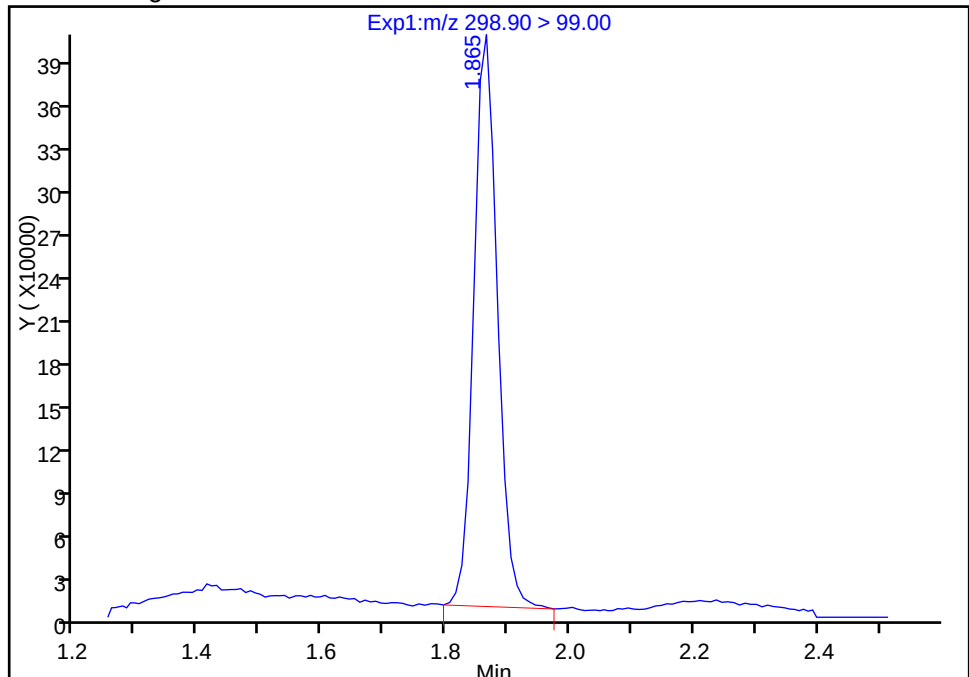
RT: 1.86  
Area: 1143731  
Amount: 7.663405  
Amount Units: ng/ml

## Processing Integration Results



RT: 1.86  
Area: 1066216  
Amount: 7.663405  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 27-Mar-2017 13:48:10

Audit Action: Manually Integrated

Audit Reason: Baseline



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4DMW03-0317 DL Lab Sample ID: 320-26324-2 DL  
 Matrix: Water Lab File ID: 2017.03.15D\_025.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 10:50  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 260.1 (mL) Date Analyzed: 03/15/2017 20:16  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 10  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 155237 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q     | LOQ | LOD | DL  |
|-----------|-------------------------------------|--------|-------|-----|-----|-----|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 390    | D M   | 24  | 19  | 7.2 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 1100   | D     | 38  | 29  | 12  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 16     | J D M | 24  | 19  | 8.8 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 93   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 100  |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 113  |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d  
 Lims ID: 320-26324-A-2-A  
 Client ID: MEAFF-4DMW03-0317  
 Sample Type: Client  
 Inject. Date: 15-Mar-2017 20:16:16 ALS Bottle#: 1 Worklist Smp#: 2  
 Injection Vol: 2.0 ul Dil. Factor: 10.0000  
 Sample Info: 320-26324-a-2-a 10X  
 Misc. Info.: Plate: 1 Rack: 4  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 27-Mar-2017 13:57:56 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK006

First Level Reviewer: chandrasenas

Date: 27-Mar-2017 13:57:56

| Signal                           | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|----------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 5 Perfluorobutanesulfonic acid   |       |        |        |        |          |              |                 |      |        | M     |
| 298.90 > 80.00                   | 1.831 | 1.841  | -0.010 | 1.000  | 385815   | 0.8162       |                 |      |        | M     |
| 298.90 > 99.00                   | 1.831 | 1.841  | -0.010 | 1.000  | 155188   |              | 2.49(0.00-0.00) |      |        | M     |
| D 11 18O2 PFHxS                  |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                   | 2.437 | 2.441  | -0.004 |        | 1528142  | 5.25         |                 | 11.3 | 71358  |       |
| 15 Perfluorooctanoic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 413.00 > 369.00                  | 2.780 | 2.784  | -0.004 | 1.000  | 3964320  | 20.3         |                 |      | 37171  | M     |
| 413.00 > 169.00                  | 2.780 | 2.784  | -0.004 | 1.000  | 2453867  |              | 1.62(0.90-1.10) |      | 62525  | M     |
| D 14 13C4 PFOA                   |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                  | 2.780 | 2.784  | -0.004 |        | 935591   | 4.56         |                 | 9.3  | 72125  |       |
| 17 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                   | 3.033 | 3.156  | -0.123 | 1.000  | 14038449 | 58.9         |                 |      | 124488 |       |
| 499.00 > 99.00                   | 3.033 | 3.156  | -0.123 | 1.000  | 2431395  |              | 5.77(0.90-1.10) |      | 21315  |       |
| D 18 13C4 PFOS                   |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                   | 3.145 | 3.156  | -0.011 |        | 1134273  | 4.69         |                 | 10.0 | 31505  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d

Injection Date: 15-Mar-2017 20:16:16

Instrument ID: A8\_N

Lims ID: 320-26324-A-2-A

Lab Sample ID: 320-26324-2

Client ID: MEAFF-4DMW03-0317

Operator ID: A8-PC\A8

ALS Bottle#: 1

Worklist Smp#: 2

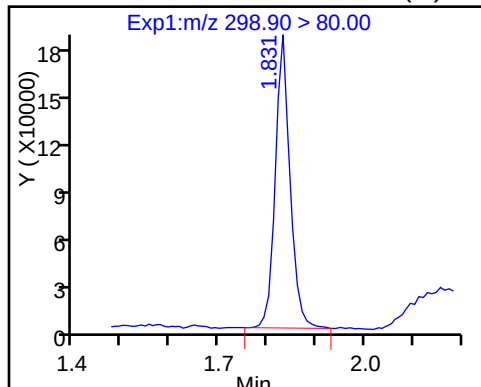
Injection Vol: 2.0 ul

Dil. Factor: 10.0000

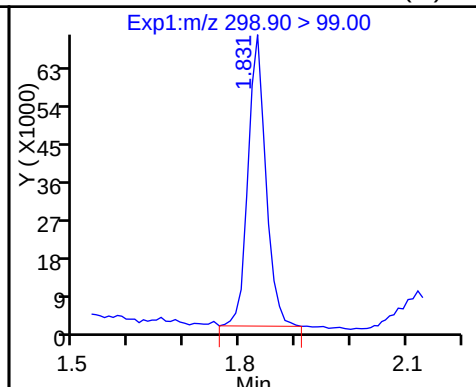
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

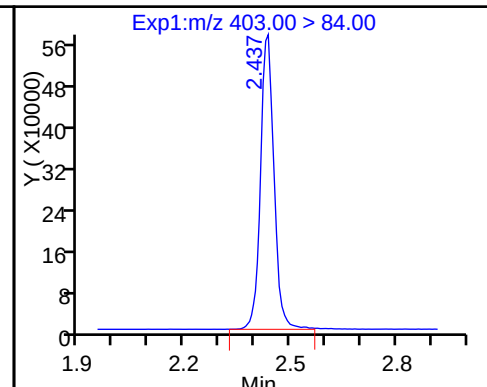
5 Perfluorobutanesulfonic acid (M)



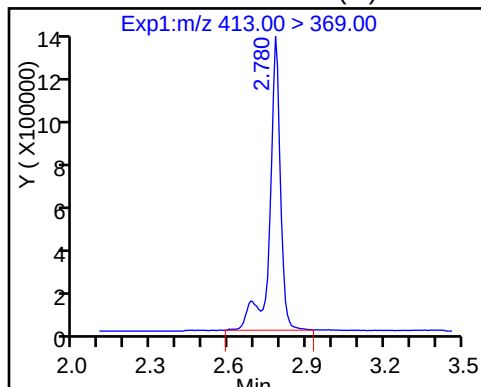
5 Perfluorobutanesulfonic acid (M)



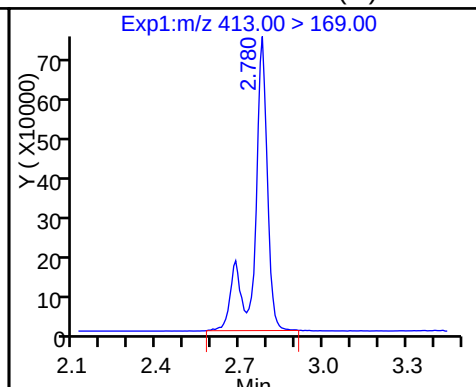
D 11 18O2 PFHxS



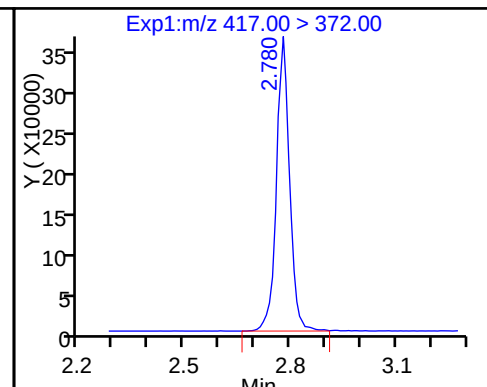
15 Perfluorooctanoic acid (M)



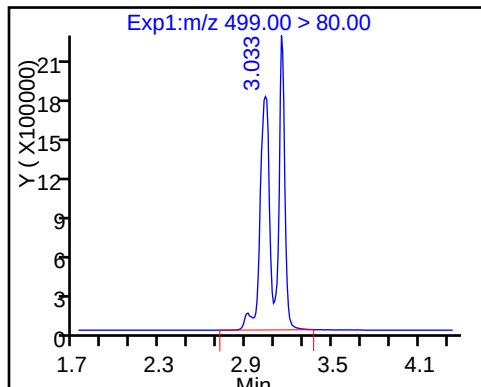
15 Perfluorooctanoic acid (M)



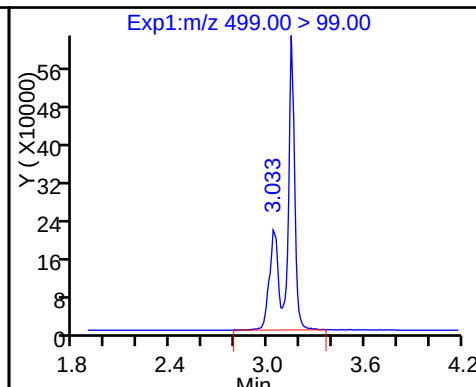
D 14 13C4 PFOA



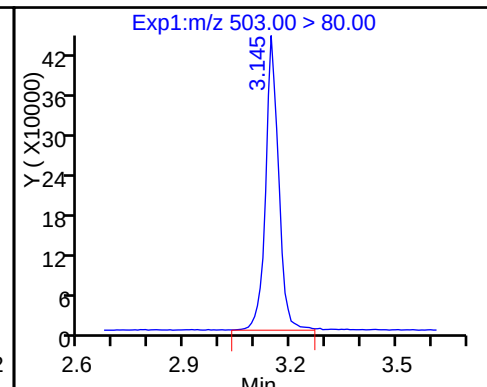
17 Perfluorooctane sulfonic acid



17 Perfluorooctane sulfonic acid



D 18 13C4 PFOS



## TestAmerica Sacramento

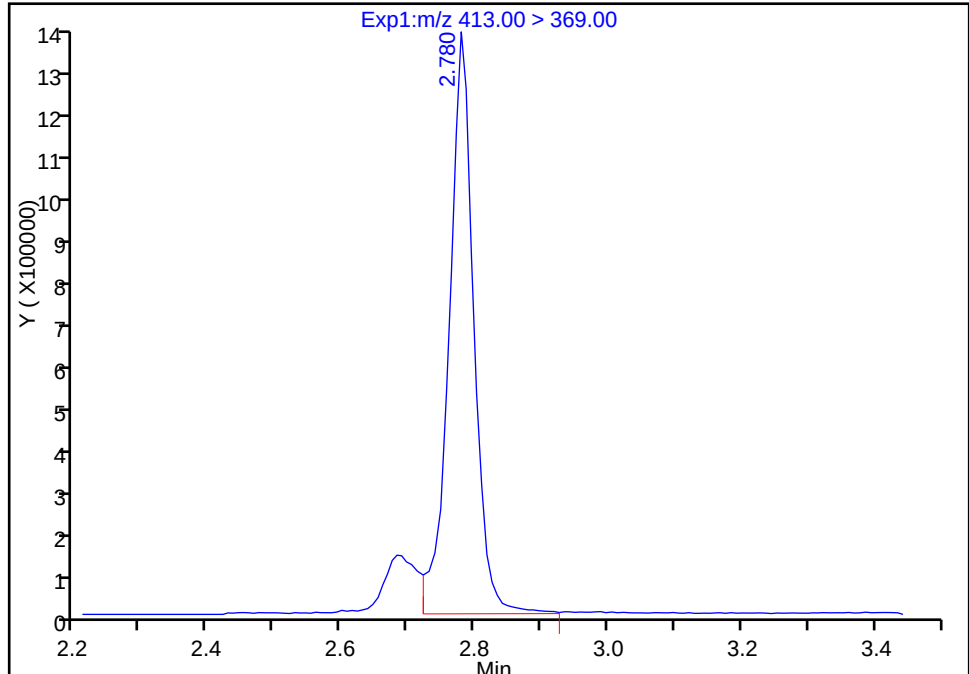
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d  
Injection Date: 15-Mar-2017 20:16:16 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 10.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

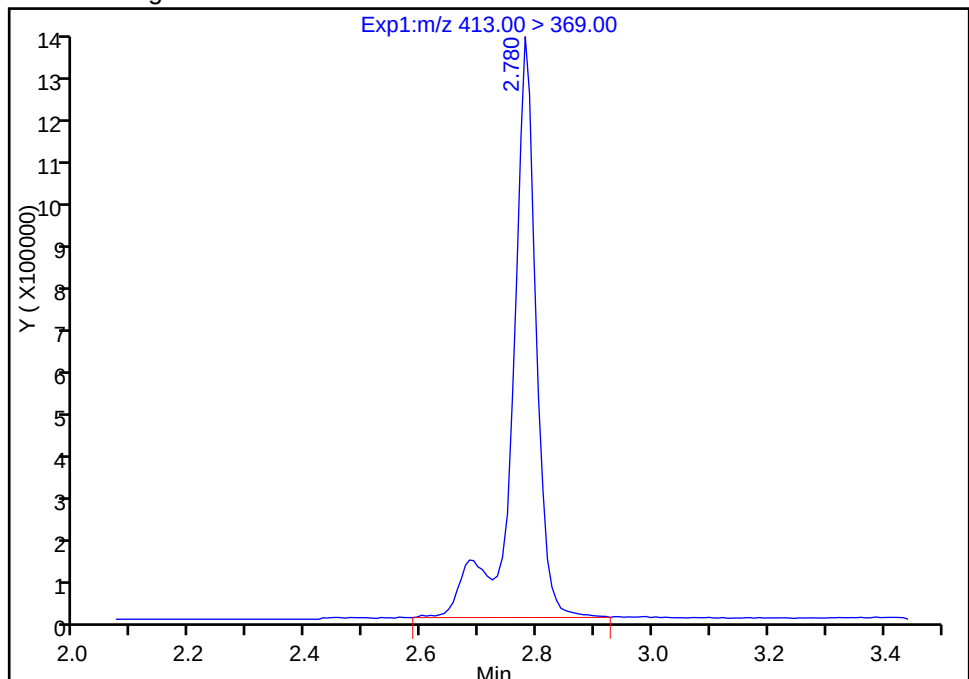
RT: 2.78  
Area: 3535427  
Amount: 18.105567  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.78  
Area: 3964320  
Amount: 20.302006  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 27-Mar-2017 13:57:28

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

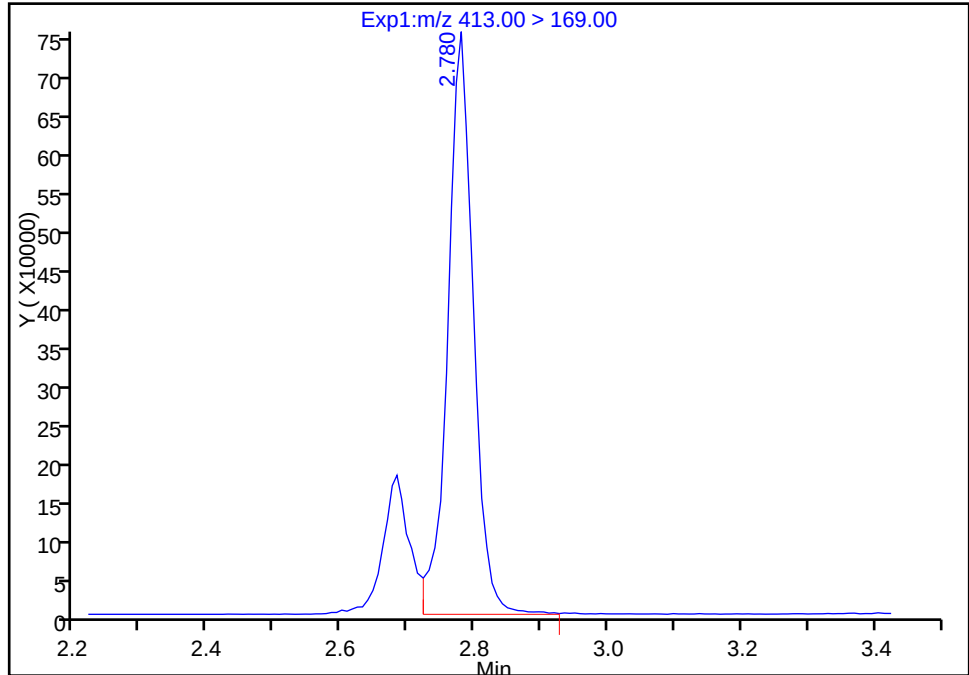
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d  
Injection Date: 15-Mar-2017 20:16:16 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 10.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

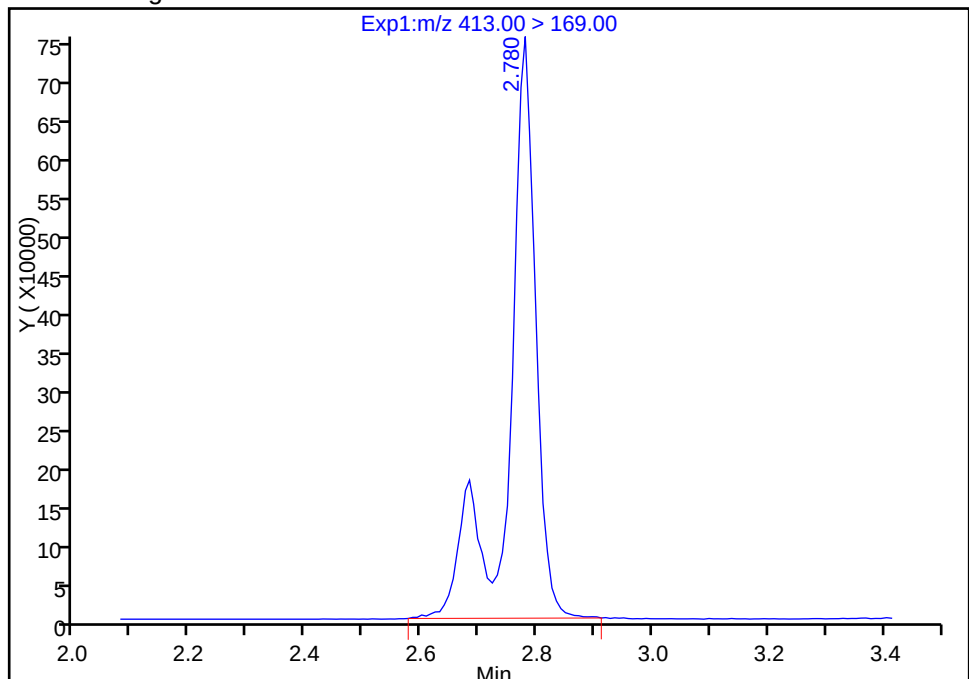
RT: 2.78  
Area: 1987707  
Amount: 18.105567  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.78  
Area: 2453867  
Amount: 20.302006  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 27-Mar-2017 13:57:28

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

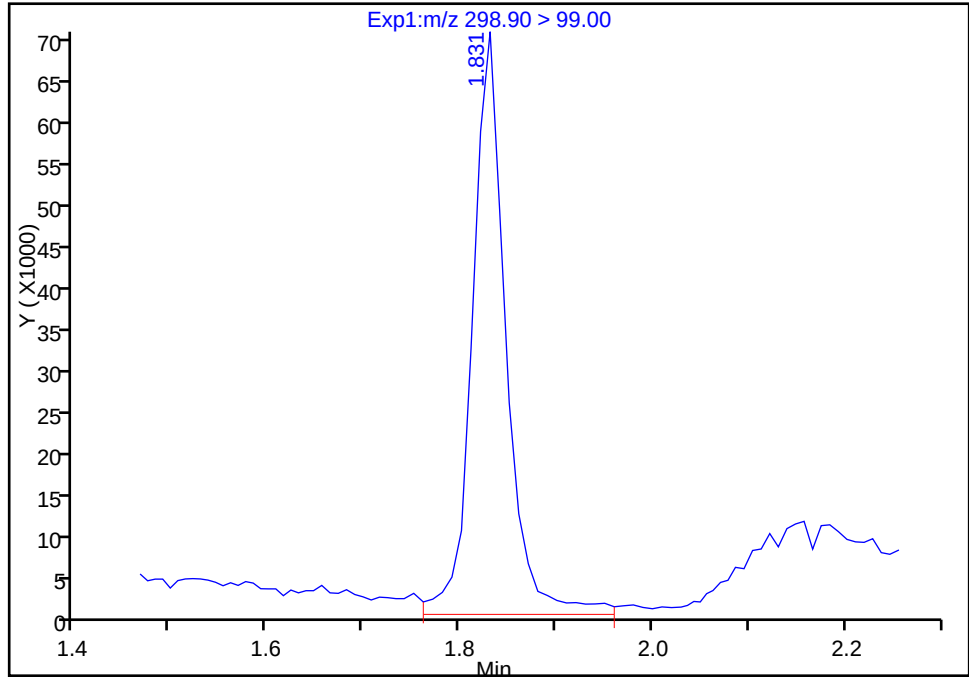
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d  
Injection Date: 15-Mar-2017 20:16:16 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 10.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

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

Signal: 2

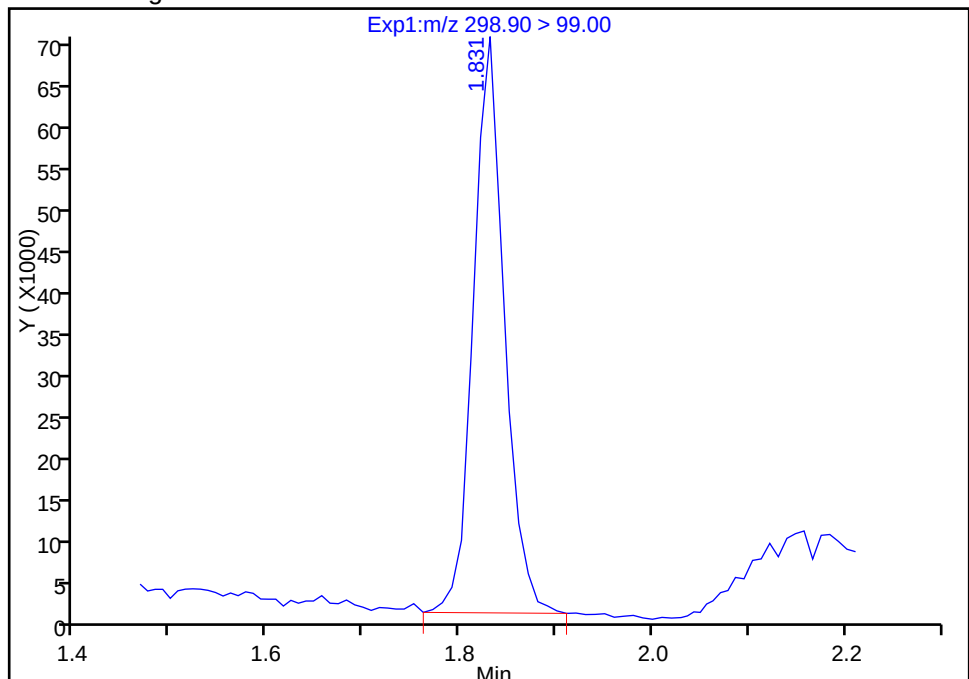
RT: 1.83  
Area: 171963  
Amount: 0.822358  
Amount Units: ng/ml

## Processing Integration Results



RT: 1.83  
Area: 155188  
Amount: 0.816154  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 27-Mar-2017 13:57:40

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

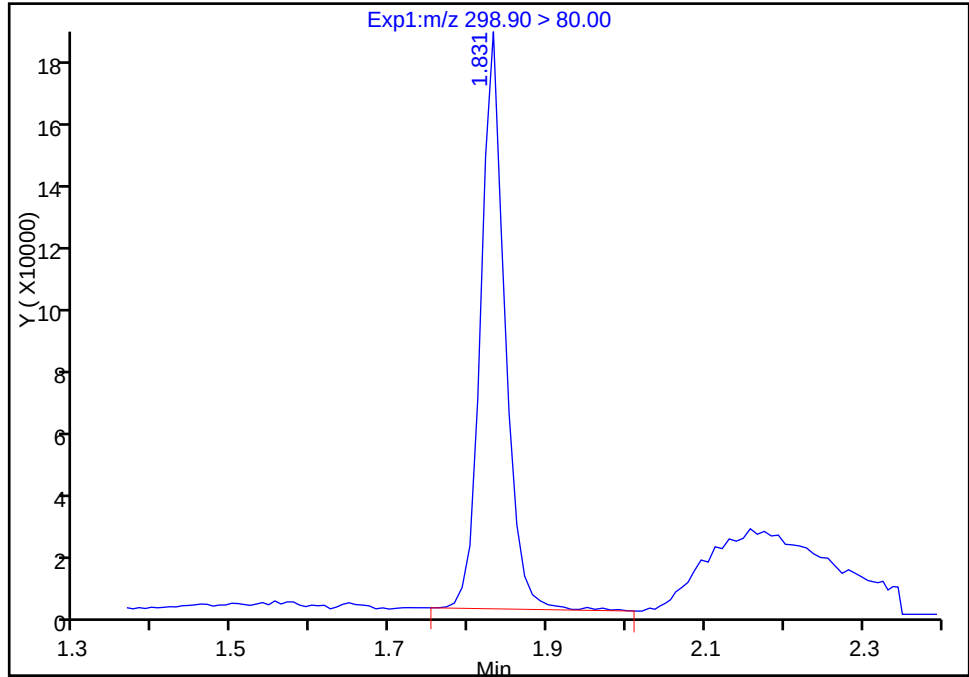
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_025.d  
Injection Date: 15-Mar-2017 20:16:16 Instrument ID: A8\_N  
Lims ID: 320-26324-A-2-A Lab Sample ID: 320-26324-2  
Client ID: MEAFF-4DMW03-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 10.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

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

Signal: 1

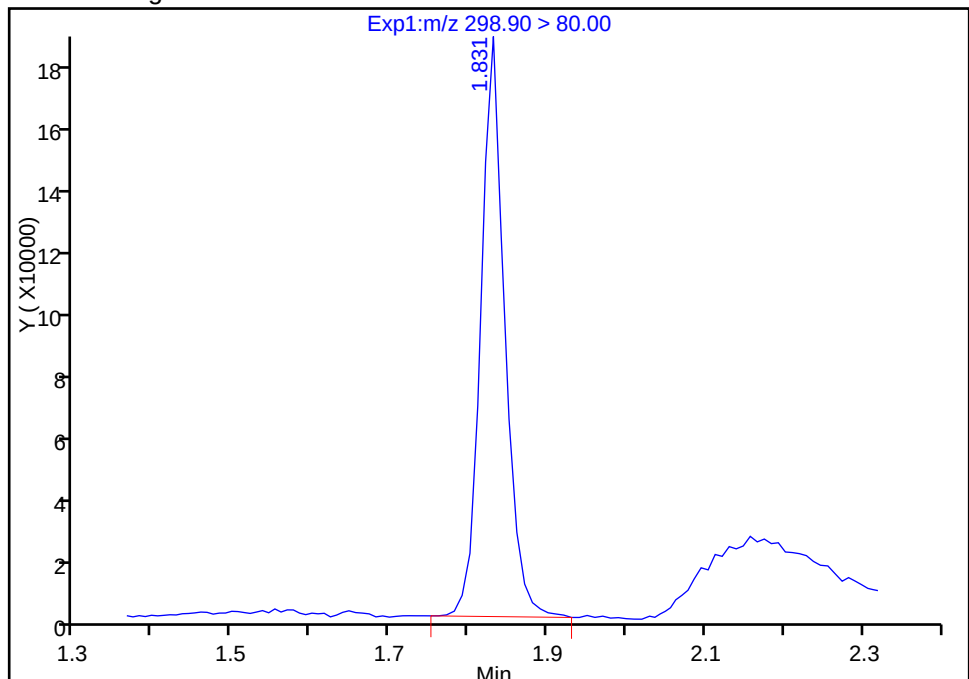
RT: 1.83  
Area: 388748  
Amount: 0.822358  
Amount Units: ng/ml

## Processing Integration Results



RT: 1.83  
Area: 385815  
Amount: 0.816154  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 27-Mar-2017 13:57:47

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW02-0317 Lab Sample ID: 320-26324-3  
 Matrix: Water Lab File ID: 2017.03.11D\_068.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 13:05  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 265.4 (mL) Date Analyzed: 03/12/2017 03:58  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q   | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|-----|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U M | 2.4 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U M | 3.8 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U   | 2.4 | 1.9 | 0.86 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 38   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 93   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 102  |   | 25-150 |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_068.d  
 Lims ID: 320-26324-A-3-A  
 Client ID: MEAFF-4BMW02-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 03:58:06 ALS Bottle#: 5 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-3-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:14:52 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:14:52

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|

## D 1 13C4 PFBA

|                 |       |       |        |  |         |      |  |      |        |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|
| 217.00 > 172.00 | 1.530 | 1.538 | -0.008 |  | 7910609 | 27.1 |  | 55.3 | 522388 |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|

## D 3 13C5-PFPeA

|                 |       |       |        |  |         |      |  |      |        |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|
| 267.90 > 223.00 | 1.821 | 1.822 | -0.001 |  | 7011523 | 30.2 |  | 61.7 | 429663 |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|

## 4 Perfluoropentanoic acid

|                 |       |       |        |       |       |        |  |  |     |  |
|-----------------|-------|-------|--------|-------|-------|--------|--|--|-----|--|
| 262.90 > 219.00 | 1.811 | 1.822 | -0.011 | 1.000 | 42941 | 0.3064 |  |  | 388 |  |
|-----------------|-------|-------|--------|-------|-------|--------|--|--|-----|--|

## D 47 13C3-PFBS

|                |       |       |     |  |        |    |  |  |  |  |
|----------------|-------|-------|-----|--|--------|----|--|--|--|--|
| 301.90 > 83.00 | 1.851 | 1.851 | 0.0 |  | 359347 | NC |  |  |  |  |
|----------------|-------|-------|-----|--|--------|----|--|--|--|--|

## 5 Perfluorobutanesulfonic acid

|                |       |       |     |       |       |        |                 |  |  |  |
|----------------|-------|-------|-----|-------|-------|--------|-----------------|--|--|--|
| 298.90 > 80.00 | 1.861 | 1.861 | 0.0 | 1.000 | 16435 | 0.0388 |                 |  |  |  |
| 298.90 > 99.00 | 1.861 | 1.861 | 0.0 | 1.000 | 7143  |        | 2.30(0.00-0.00) |  |  |  |

## D 60 M2-4:2FTS

|                 |       |       |       |  |     |    |  |  |  |  |
|-----------------|-------|-------|-------|--|-----|----|--|--|--|--|
| 329.00 > 309.00 | 2.095 | 2.082 | 0.013 |  | 502 | NC |  |  |  |  |
|-----------------|-------|-------|-------|--|-----|----|--|--|--|--|

## D 7 13C2 PFHxA

|                 |       |       |        |  |         |      |  |      |        |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|
| 315.00 > 270.00 | 2.113 | 2.116 | -0.003 |  | 4861941 | 23.1 |  | 47.1 | 180316 |  |
|-----------------|-------|-------|--------|--|---------|------|--|------|--------|--|

## D 9 13C4-PFHpA

|                 |       |       |       |  |         |      |  |      |        |  |
|-----------------|-------|-------|-------|--|---------|------|--|------|--------|--|
| 367.00 > 322.00 | 2.452 | 2.447 | 0.005 |  | 4289796 | 22.2 |  | 45.4 | 201441 |  |
|-----------------|-------|-------|-------|--|---------|------|--|------|--------|--|

## 8 Perfluorohexanesulfonic acid

|                |       |       |        |       |       |        |  |  |  |   |
|----------------|-------|-------|--------|-------|-------|--------|--|--|--|---|
| 399.00 > 80.00 | 2.460 | 2.463 | -0.003 | 1.000 | 64539 | 0.2120 |  |  |  | M |
|----------------|-------|-------|--------|-------|-------|--------|--|--|--|---|

M

## D 11 18O2 PFHxS

|                |       |       |        |  |          |      |  |     |        |  |
|----------------|-------|-------|--------|--|----------|------|--|-----|--------|--|
| 403.00 > 84.00 | 2.460 | 2.463 | -0.003 |  | 13704724 | 47.1 |  | 102 | 458854 |  |
|----------------|-------|-------|--------|--|----------|------|--|-----|--------|--|

## 13 Sodium 1H,1H,2H,2H-perfluorooctane

|                 |       |       |       |       |       |    |  |  |  |  |
|-----------------|-------|-------|-------|-------|-------|----|--|--|--|--|
| 427.00 > 407.00 | 2.787 | 2.781 | 0.006 | 1.000 | 42394 | NR |  |  |  |  |
|-----------------|-------|-------|-------|-------|-------|----|--|--|--|--|

## D 12 M2-6:2FTS

|                 |       |       |        |  |      |        |  |     |  |  |
|-----------------|-------|-------|--------|--|------|--------|--|-----|--|--|
| 429.00 > 409.00 | 2.779 | 2.781 | -0.002 |  | 2041 | 0.0264 |  | 0.0 |  |  |
|-----------------|-------|-------|--------|--|------|--------|--|-----|--|--|

## 15 Perfluorooctanoic acid

|                 |       |       |        |       |       |        |  |  |     |   |
|-----------------|-------|-------|--------|-------|-------|--------|--|--|-----|---|
| 413.00 > 369.00 | 2.810 | 2.812 | -0.002 | 1.000 | 22108 | 0.2770 |  |  | 243 | M |
|-----------------|-------|-------|--------|-------|-------|--------|--|--|-----|---|

M

|                 |       |       |       |       |       |  |                 |  |     |   |
|-----------------|-------|-------|-------|-------|-------|--|-----------------|--|-----|---|
| 413.00 > 169.00 | 2.818 | 2.812 | 0.006 | 1.003 | 12460 |  | 1.77(0.90-1.10) |  | 439 | M |
|-----------------|-------|-------|-------|-------|-------|--|-----------------|--|-----|---|

M

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)    | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|------------------|------|--------|-------|
| D 14 13C4 PFOA                        |       |           |           |           |          |                 |                  |      |        |       |
| 417.00 > 372.00                       | 2.810 | 2.812     | -0.002    |           | 3824324  | 18.7            |                  | 38.1 | 185785 |       |
| 17 Perfluorooctane sulfonic acid      |       |           |           |           |          |                 |                  |      |        | M     |
| 499.00 > 80.00                        | 3.185 | 3.186     | -0.001    | 1.000     | 132289   | 0.5996          |                  |      | 3193   | M     |
| 499.00 > 99.00                        | 3.202 | 3.186     | 0.016     | 1.005     | 29691    |                 | 4.46(0.90-1.10)  |      | 1368   | M     |
| D 18 13C4 PFOS                        |       |           |           |           |          |                 |                  |      |        |       |
| 503.00 > 80.00                        | 3.194 | 3.194     | 0.0       |           | 10498767 | 43.4            |                  | 92.8 | 201598 |       |
| D 19 13C5 PFNA                        |       |           |           |           |          |                 |                  |      |        |       |
| 468.00 > 423.00                       | 3.194 | 3.194     | 0.0       |           | 2791787  | 15.7            |                  | 32.1 | 96716  |       |
| D 21 13C8 FOSA                        |       |           |           |           |          |                 |                  |      |        |       |
| 506.00 > 78.00                        | 3.541 | 3.520     | 0.021     |           | 423201   | 1.15            |                  | 2.4  | 29052  |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |           |           |           |          |                 |                  |      |        |       |
| 527.00 > 507.00                       | 3.524 | 3.537     | -0.013    | 0.991     | 1904     | NR              |                  |      |        |       |
| D 26 M2-8:2FTS                        |       |           |           |           |          |                 |                  |      |        |       |
| 529.00 > 509.00                       | 3.558 | 3.537     | 0.021     |           | 411      | 0.004438        |                  | 0.0  |        |       |
| D 23 13C2 PFDA                        |       |           |           |           |          |                 |                  |      |        |       |
| 515.00 > 470.00                       | 3.549 | 3.554     | -0.005    |           | 2582560  | 15.5            |                  | 31.6 | 71598  |       |
| D 27 d3-NMeFOSAA                      |       |           |           |           |          |                 |                  |      |        |       |
| 573.00 > 419.00                       | 3.660 | 3.693     | -0.033    |           | 1112     | 0.0131          |                  | 0.0  |        |       |
| D 30 13C2 PFUnA                       |       |           |           |           |          |                 |                  |      |        |       |
| 565.00 > 520.00                       | 3.879 | 3.867     | 0.012     |           | 2536813  | 19.4            |                  | 39.6 | 125134 |       |
| D 32 d5-NEtFOSAA                      |       |           |           |           |          |                 |                  |      |        |       |
| 589.00 > 419.00                       | 3.853 | 3.867     | -0.014    |           | 3817     | 0.0469          |                  | 0.0  |        |       |
| 31 Perfluoroundecanoic acid           |       |           |           |           |          |                 |                  |      |        |       |
| 563.00 > 519.00                       | 3.888 | 3.876     | 0.012     | 1.000     | 7972     | 0.1518          |                  |      | 216    |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |           |           |           |          |                 |                  |      |        |       |
| 584.00 > 419.00                       | 3.957 | 3.876     | 0.081     | 1.027     | 329      | NR              |                  |      |        |       |
| D 34 d-N-MeFOSA-M                     |       |           |           |           |          |                 |                  |      |        |       |
| 515.00 > 169.00                       | 4.037 | 4.019     | 0.018     |           | 340      | 0.003864        |                  | 0.0  |        |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                  |      |        |       |
| 613.00 > 569.00                       | 4.170 | 4.159     | 0.011     | 1.000     | 7133     | 0.1373          |                  |      | 202    |       |
| D 36 13C2 PFDoA                       |       |           |           |           |          |                 |                  |      |        |       |
| 615.00 > 570.00                       | 4.170 | 4.166     | 0.004     |           | 2780196  | 22.4            |                  | 45.8 | 102610 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                  |      |        |       |
| 531.00 > 169.00                       | 4.197 | 4.202     | -0.005    |           | 431      | 0.005056        |                  | 0.0  |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                  |      |        |       |
| 663.00 > 619.00                       | 4.442 | 4.421     | 0.021     | 1.000     | 14854    | 0.2994          |                  |      | 287    |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                  |      |        |       |
| 712.50 > 668.90                       | 4.690 | 4.658     | 0.032     | 1.000     | 99628    | 0.8920          |                  |      | 690    |       |
| 713.00 > 169.00                       | 4.672 | 4.658     | 0.014     | 0.996     | 9741     |                 | 10.23(0.00-0.00) |      | 3714   |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                  |      |        |       |
| 715.00 > 670.00                       | 4.681 | 4.658     | 0.023     |           | 10332750 | 39.9            |                  | 81.4 | 226589 |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                  |      |        |       |
| 815.00 > 770.00                       | 5.080 | 5.072     | 0.008     |           | 5067521  | 40.5            |                  | 82.8 | 147240 |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                  |      |        |       |
| 813.00 > 769.00                       | 5.091 | 5.072     | 0.019     | 1.000     | 79302    | 1.13            |                  |      | 189    |       |

## QC Flag Legend

### Processing Flags

NR - Missing Quant Standard

NC - Not Calibrated

### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_068.d

Injection Date: 12-Mar-2017 03:58:06

Instrument ID: A8\_N

Lims ID: 320-26324-A-3-A

Lab Sample ID: 320-26324-3

Client ID: MEAFF-4BMW02-0317

Operator ID: A8-PC\A8

ALS Bottle#: 5

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

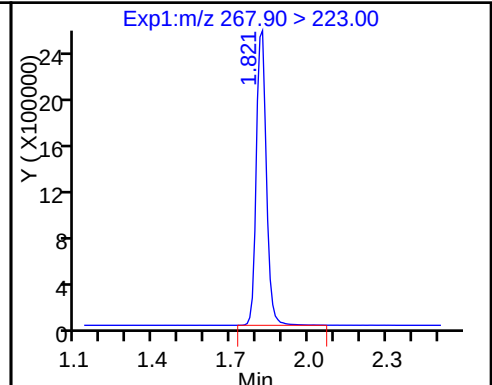
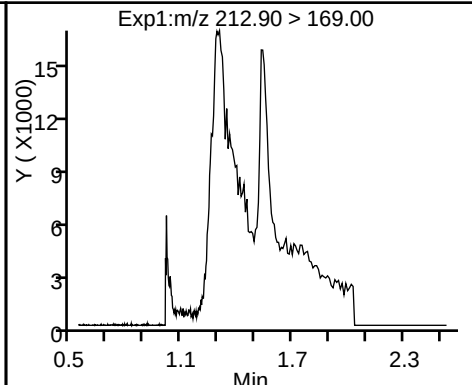
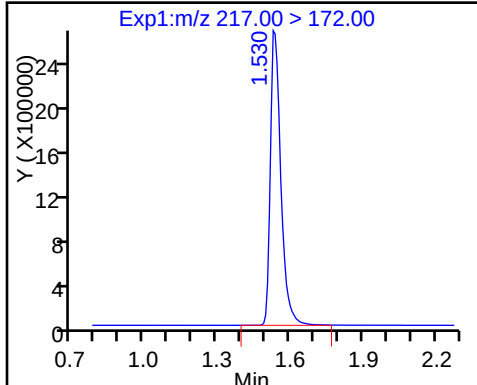
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid (ND)

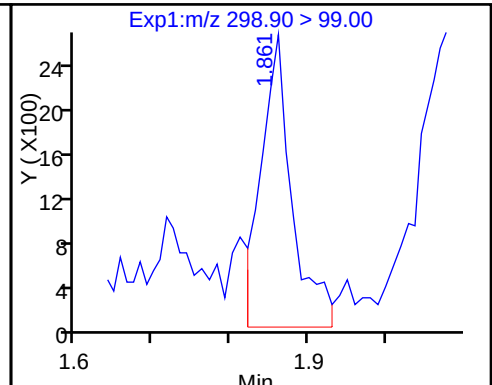
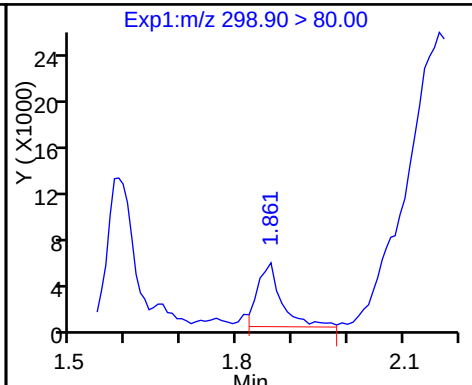
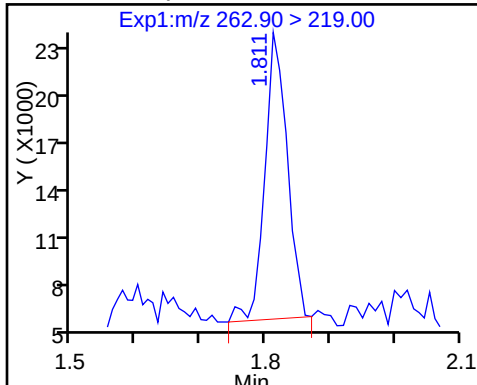
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

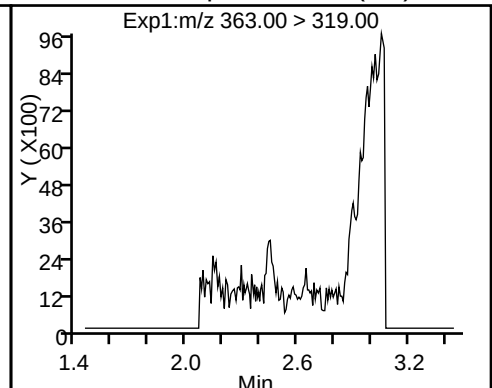
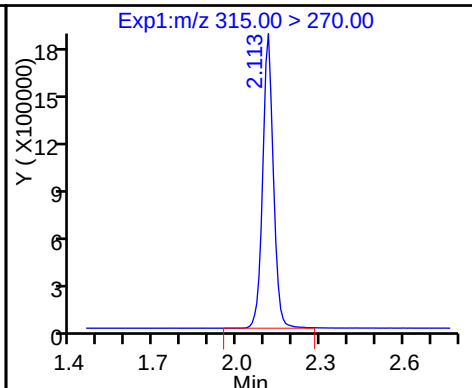
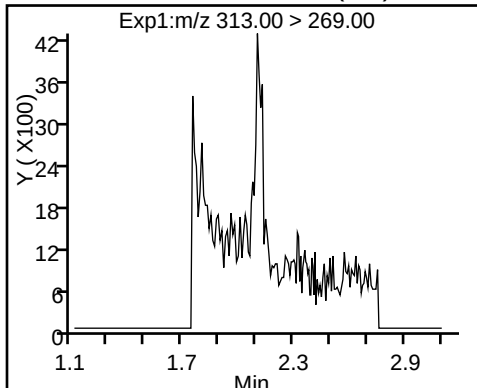
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid (ND)

D 7 13C2 PFHxA

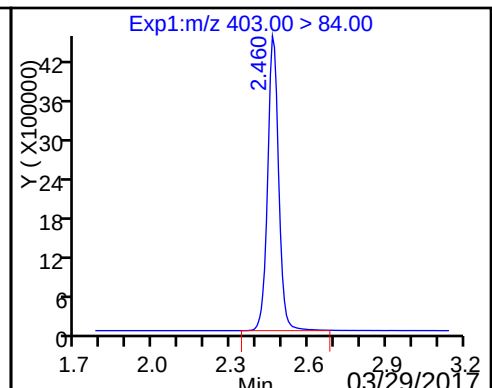
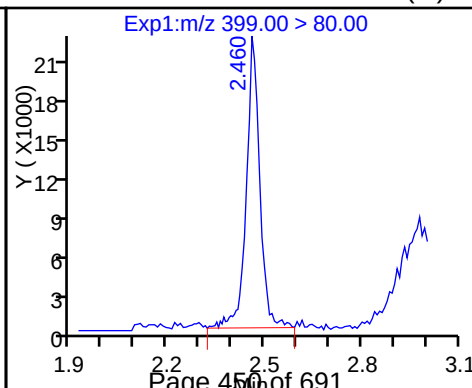
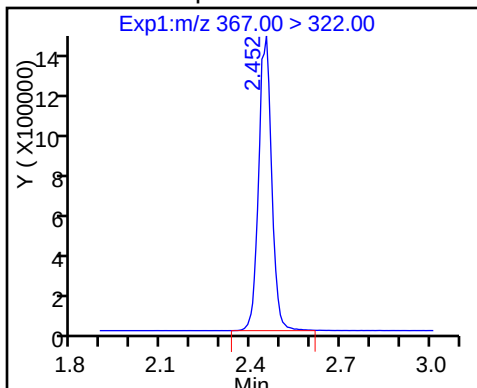
10 Perfluoroheptanoic acid (ND)



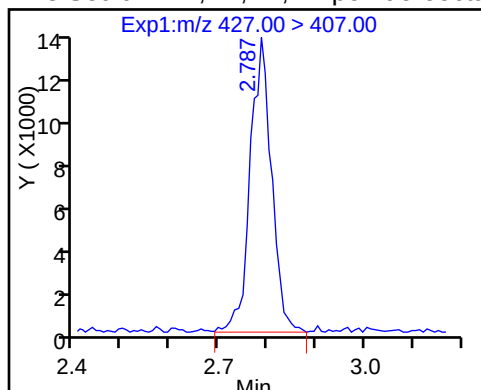
D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid (M)

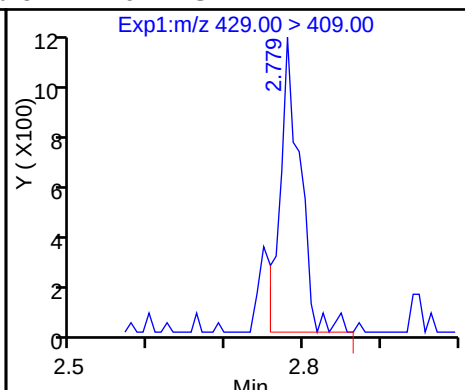
D 11 18O2 PFHxS



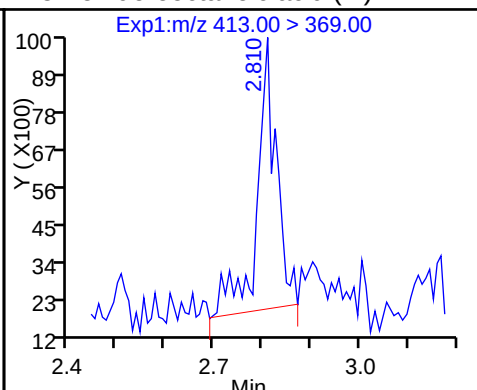
## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS



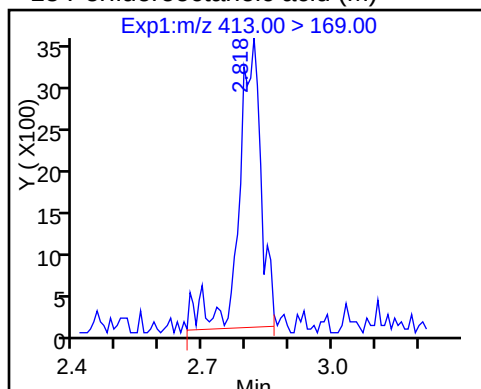
## D 12 M2-6:2FTS



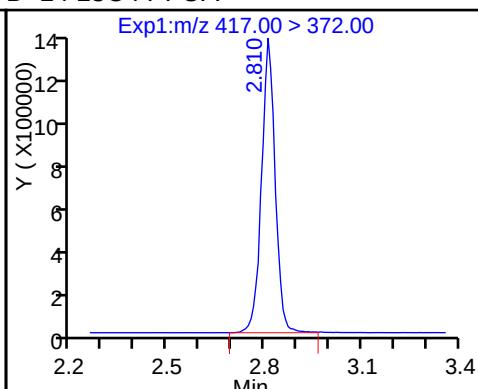
## 15 Perfluorooctanoic acid (M)



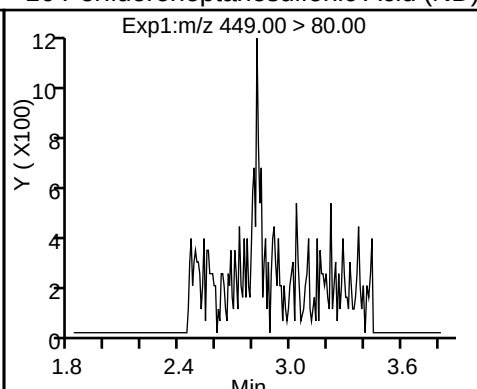
## 15 Perfluorooctanoic acid (M)



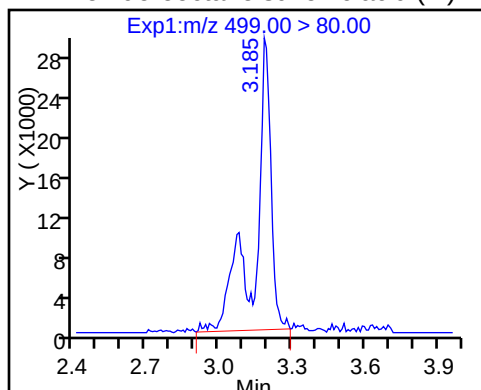
## D 14 13C4 PFOA



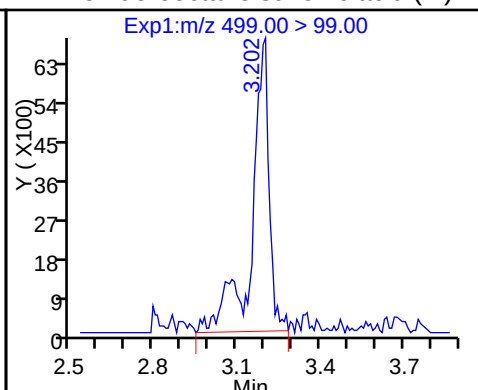
## 16 Perfluoroheptanesulfonic Acid (ND)



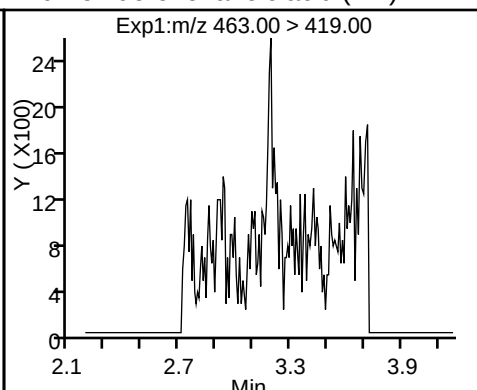
## 17 Perfluorooctane sulfonic acid (M)



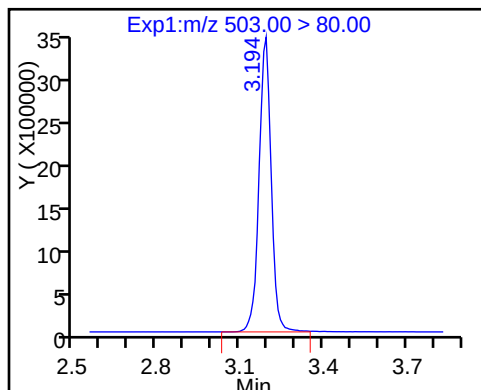
## 17 Perfluorooctane sulfonic acid (M)



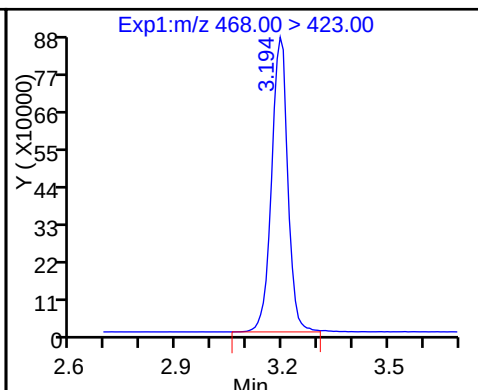
## 20 Perfluorononanoic acid (ND)



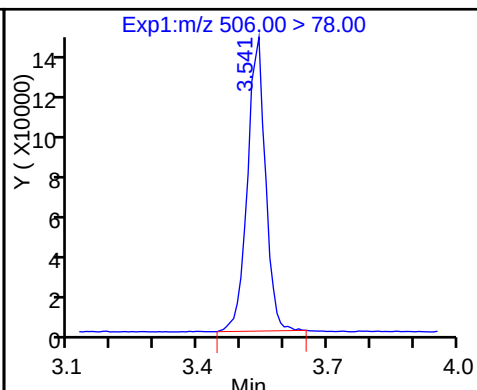
## D 18 13C4 PFOS



## D 19 13C5 PFNA



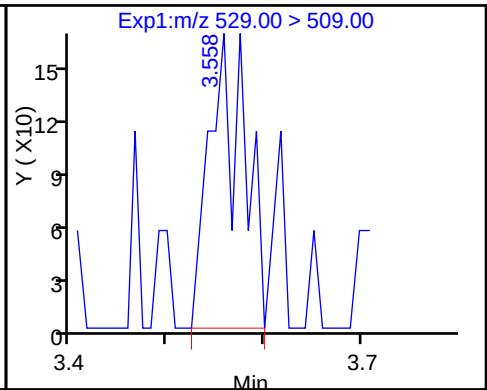
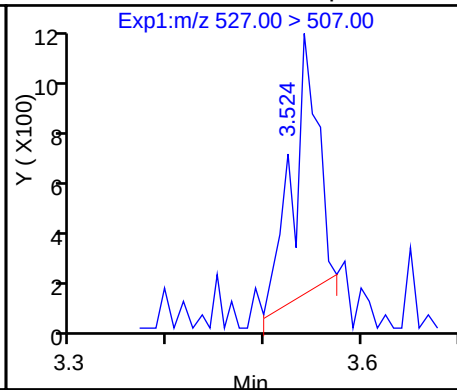
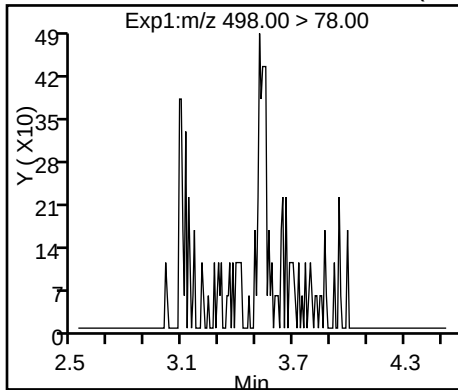
## D 21 13C8 FOSA



## 22 Perfluorooctane Sulfonamide (ND)

## 25 Sodium 1H,1H,2H,2H-perfluorooctane

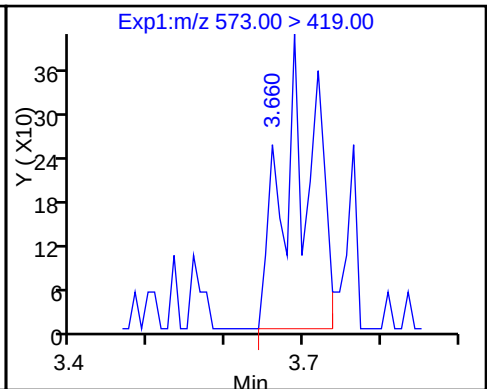
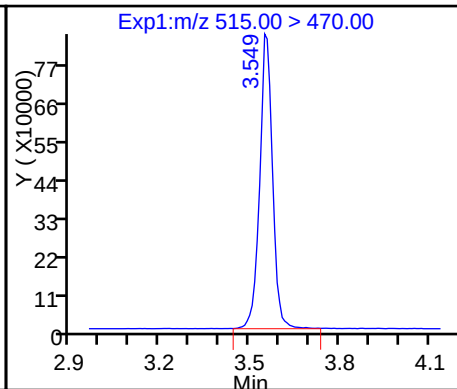
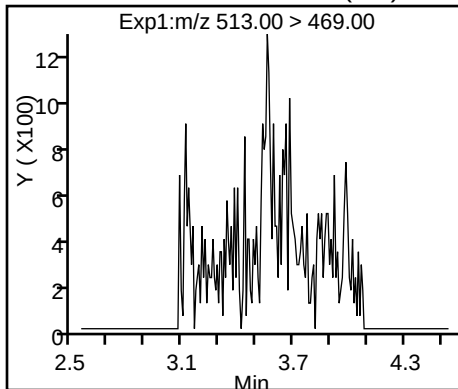
## D 26 M2-8:2FTS



## 24 Perfluorodecanoic acid (ND)

## D 23 13C2 PFDA

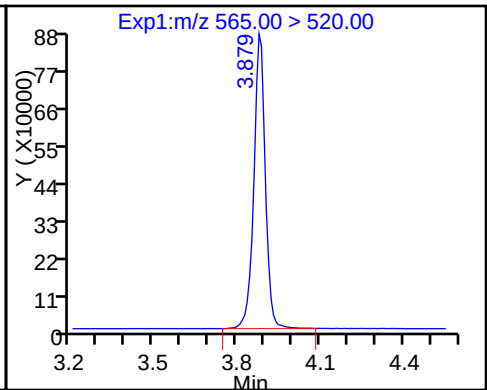
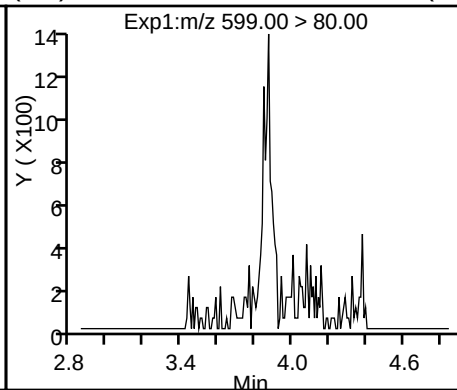
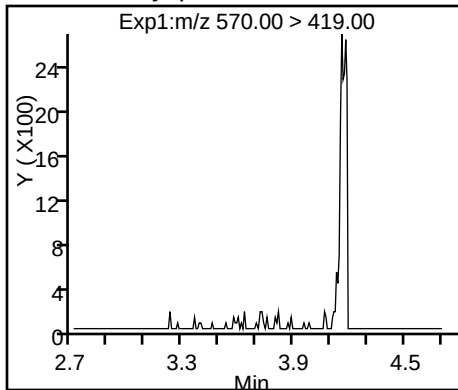
## D 27 d3-NMeFOSAA



## 28 N-methyl perfluorooctane sulfonami

## D 29 Perfluorodecane Sulfonic acid (ND)

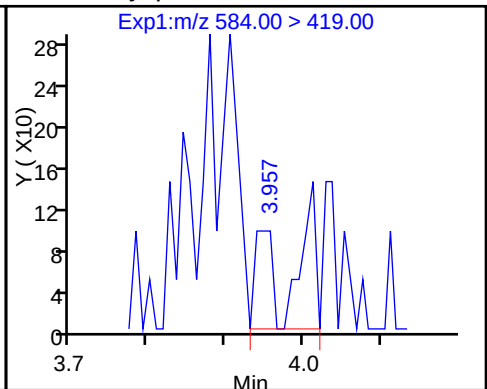
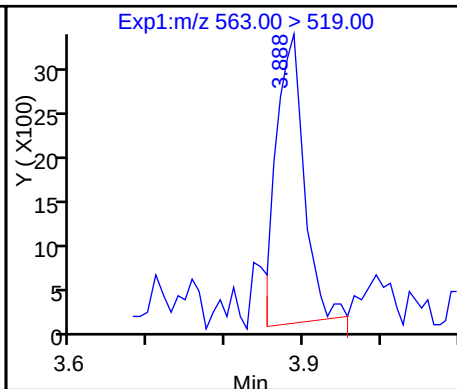
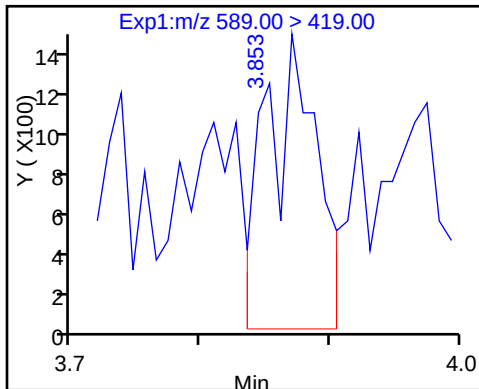
## D 30 13C2 PFUnA



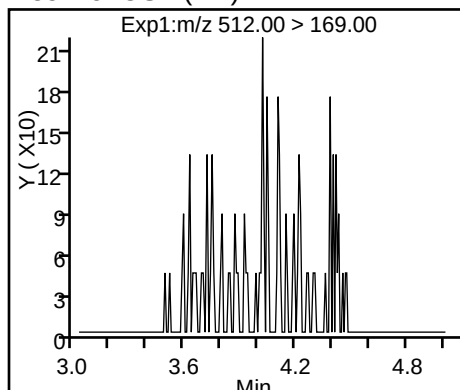
## D 32 d5-NEtFOSAA

## 31 Perfluoroundecanoic acid

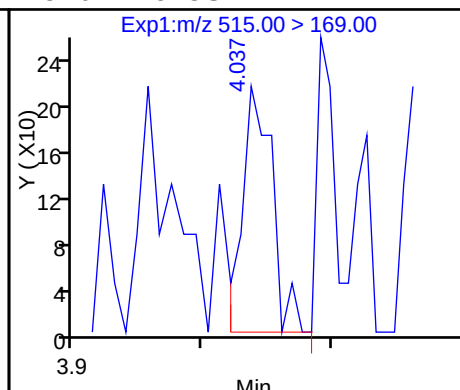
## 33 N-ethyl perfluorooctane sulfonamid



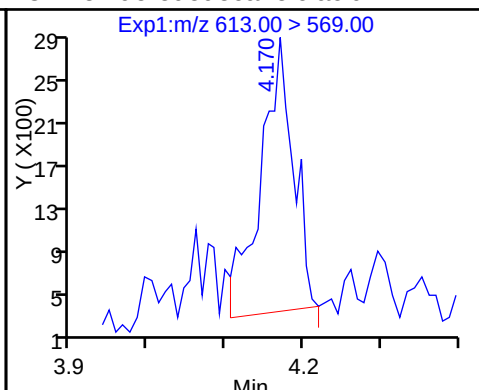
35 MeFOSA (ND)



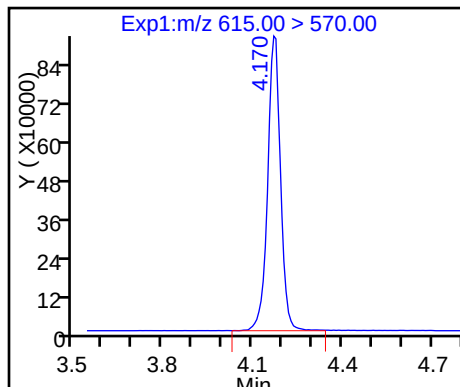
D 34 d-N-MeFOSA-M



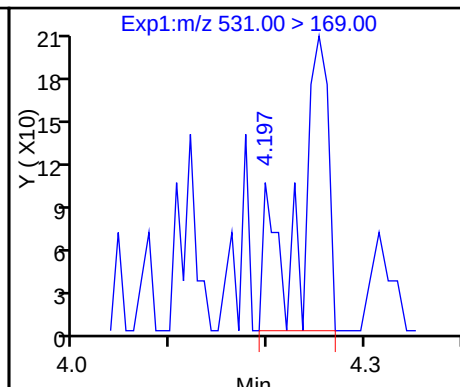
37 Perfluorododecanoic acid



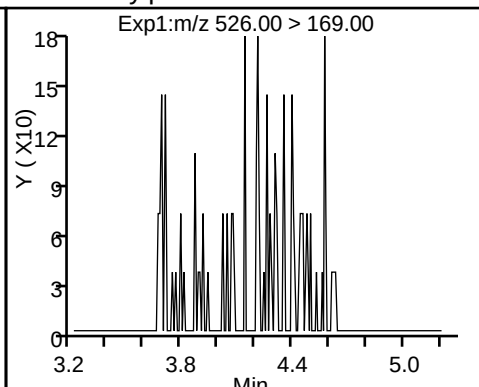
D 36 13C2 PFDaA



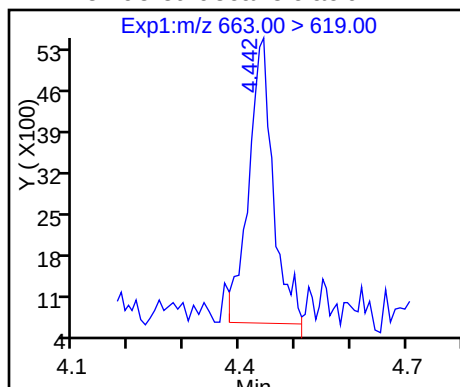
D 38 d-N-EtFOSA-M



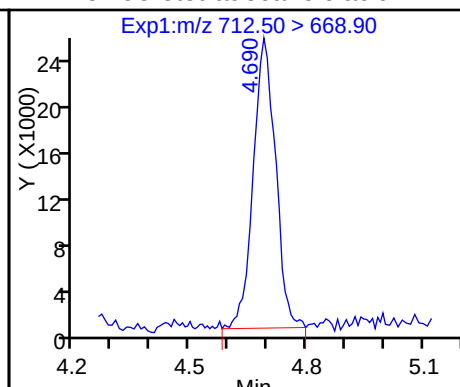
39 N-ethylperfluoro-1-octanesulfonami (ND)



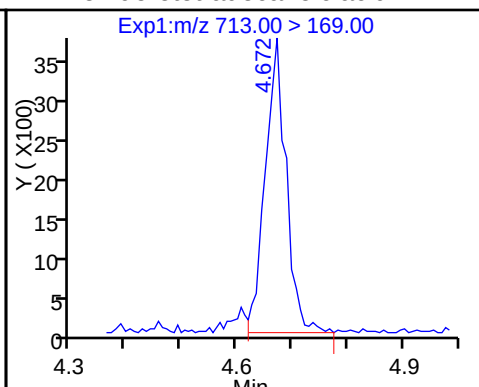
41 Perfluorotridecanoic acid



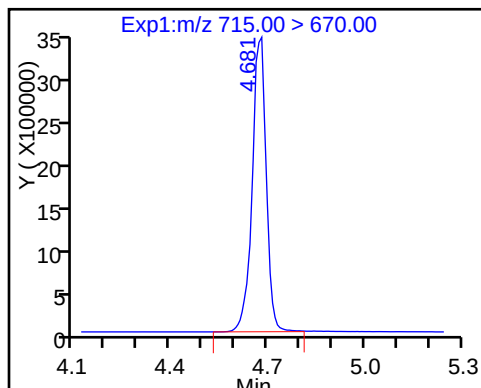
42 Perfluorotetradecanoic acid



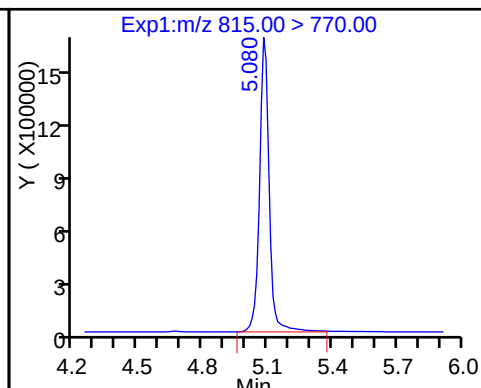
42 Perfluorotetradecanoic acid



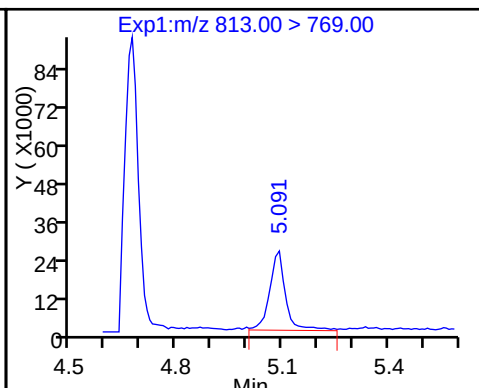
D 43 13C2-PFTeDA



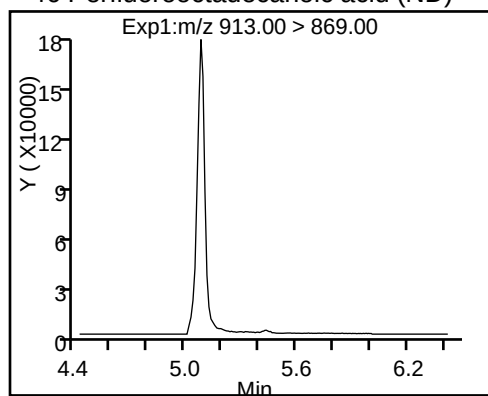
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



46 Perfluorooctadecanoic acid (ND)





## TestAmerica Sacramento

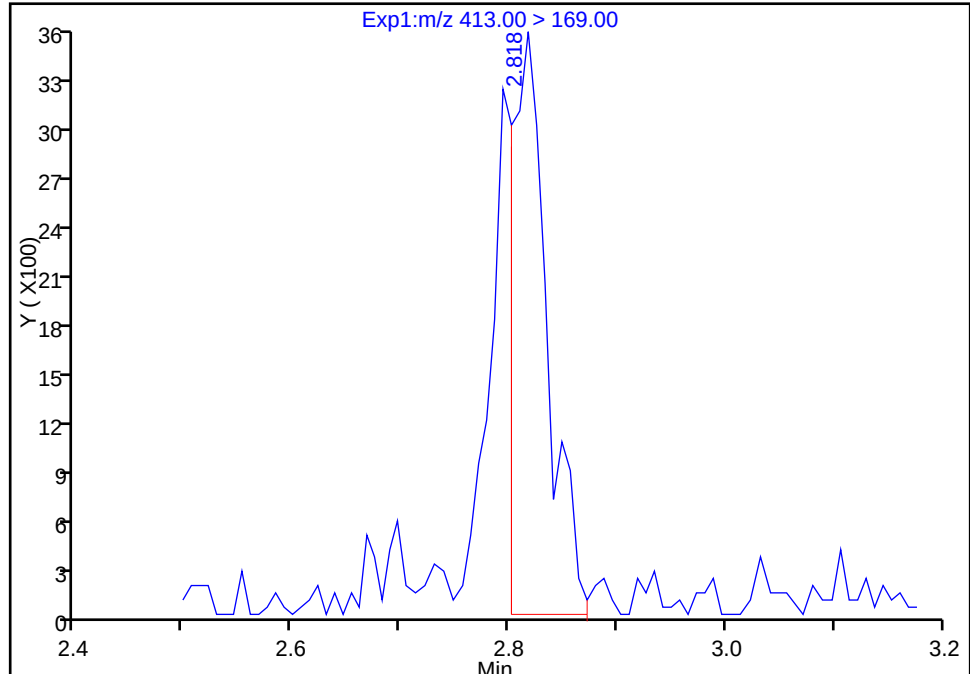
|                 |                                                                        |                |                 |                |   |
|-----------------|------------------------------------------------------------------------|----------------|-----------------|----------------|---|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20170312-40742.b\2017.03.11D_068.d |                |                 |                |   |
| Injection Date: | 12-Mar-2017 03:58:06                                                   | Instrument ID: | A8_N            |                |   |
| Lims ID:        | 320-26324-A-3-A                                                        | Lab Sample ID: | 320-26324-3     |                |   |
| Client ID:      | MEAFF-4BMW02-0317                                                      |                |                 |                |   |
| Operator ID:    | A8-PC\A8                                                               | ALS Bottle#:   | 5               | Worklist Smp#: | 6 |
| Injection Vol:  | 2.0 ul                                                                 | Dil. Factor:   | 1.0000          |                |   |
| Method:         | A8_N                                                                   | Limit Group:   | LC PFC_DOD ICAL |                |   |
| Column:         |                                                                        | Detector:      | EXP1            |                |   |

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

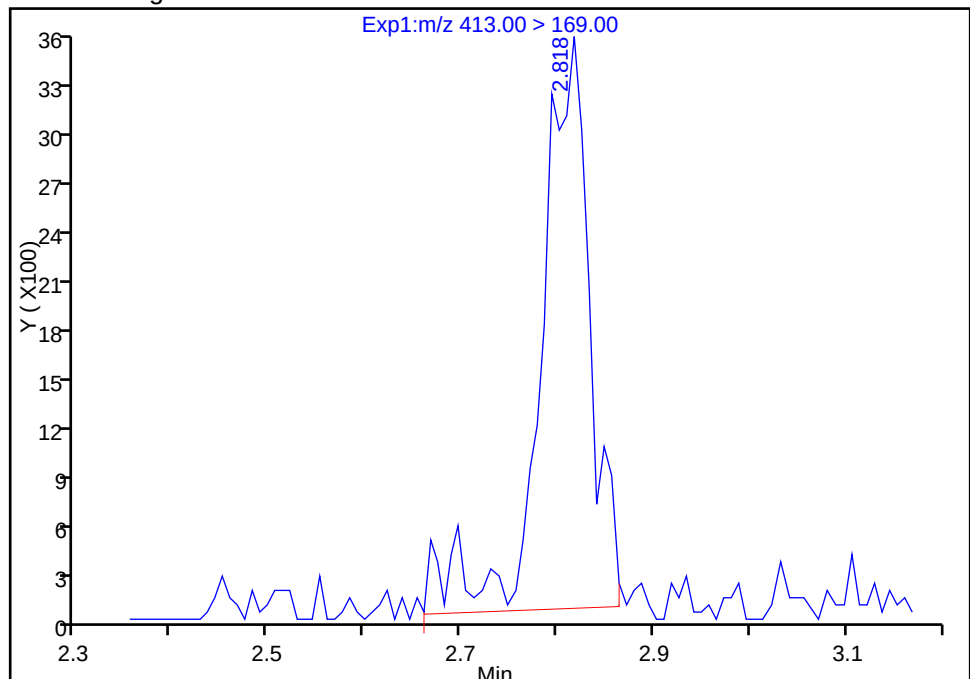
RT: 2.82  
Area: 7509  
Amount: 0.197488  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.82  
Area: 12460  
Amount: 0.276982  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:11:08  
Audit Action: Manually Integrated

Audit Reason: Isomers  
Page 455 of 691

03/29/2017

## TestAmerica Sacramento

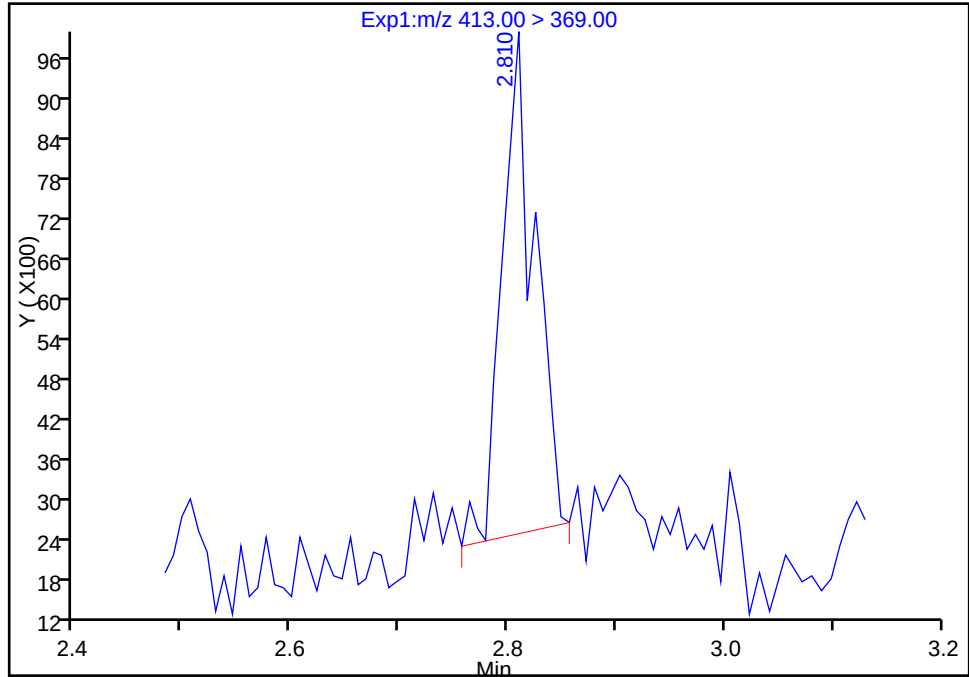
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_068.d  
Injection Date: 12-Mar-2017 03:58:06 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-A Lab Sample ID: 320-26324-3  
Client ID: MEAFF-4BMW02-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 5 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

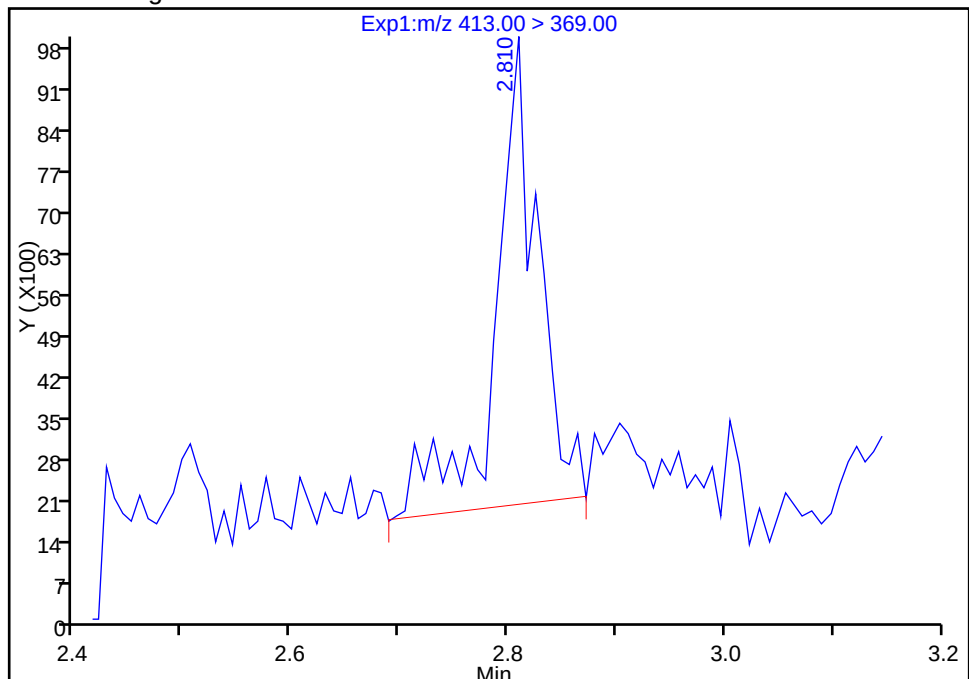
RT: 2.81  
Area: 15763  
Amount: 0.197488  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.81  
Area: 22108  
Amount: 0.276982  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:11:29

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

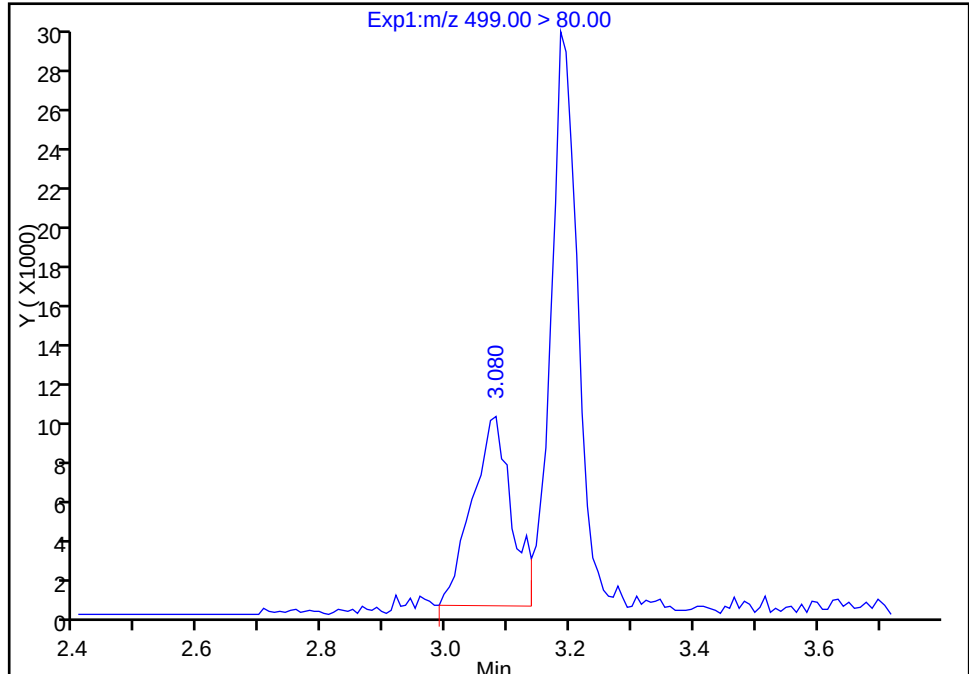
|                 |                                                                        |                |                 |                |   |
|-----------------|------------------------------------------------------------------------|----------------|-----------------|----------------|---|
| Data File:      | \\ChromNa\Sacramento\ChromData\A8_N\20170312-40742.b\2017.03.11D_068.d |                |                 |                |   |
| Injection Date: | 12-Mar-2017 03:58:06                                                   | Instrument ID: | A8_N            |                |   |
| Lims ID:        | 320-26324-A-3-A                                                        | Lab Sample ID: | 320-26324-3     |                |   |
| Client ID:      | MEAFF-4BMW02-0317                                                      |                |                 |                |   |
| Operator ID:    | A8-PC\A8                                                               | ALS Bottle#:   | 5               | Worklist Smp#: | 6 |
| Injection Vol:  | 2.0 ul                                                                 | Dil. Factor:   | 1.0000          |                |   |
| Method:         | A8_N                                                                   | Limit Group:   | LC PFC_DOD ICAL |                |   |
| Column:         |                                                                        | Detector       | EXP1            |                |   |

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

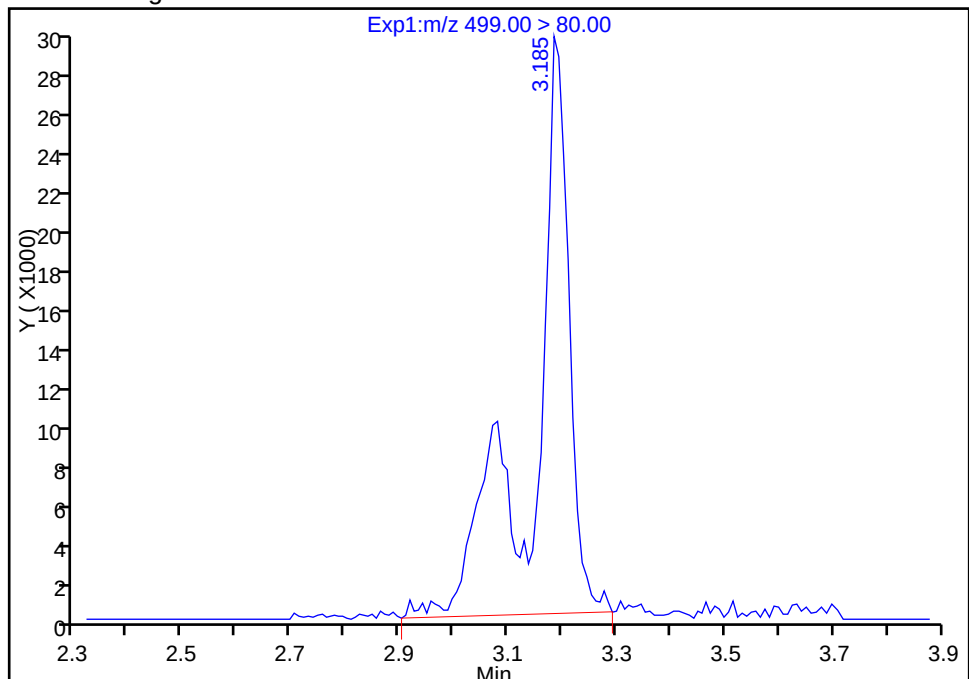
RT: 3.08  
Area: 41211  
Amount: 0.186779  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.18  
Area: 132289  
Amount: 0.599568  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:10:27

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

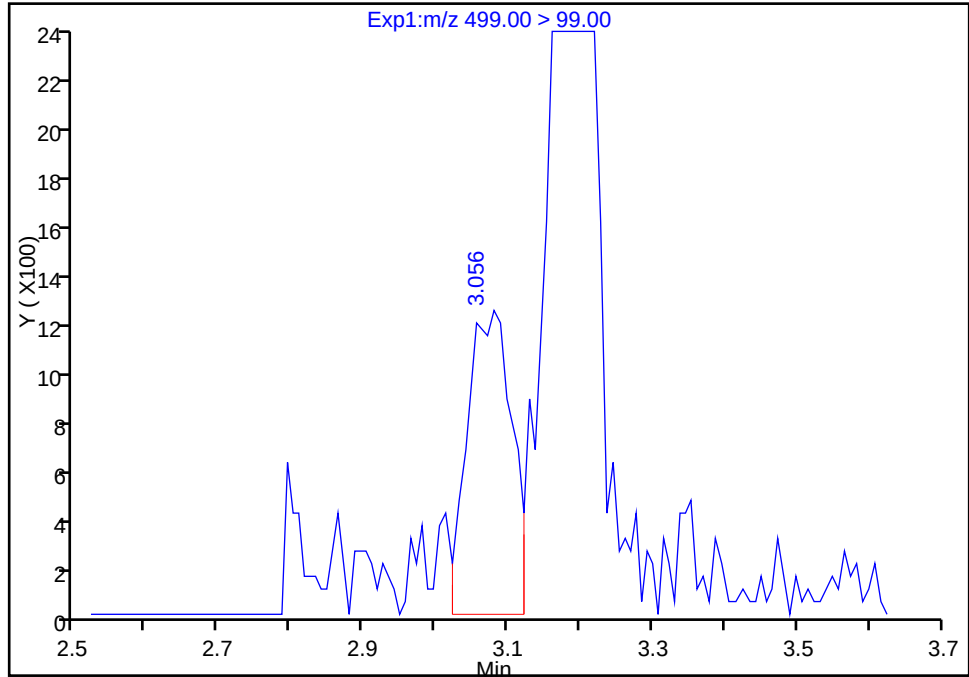
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_068.d  
Injection Date: 12-Mar-2017 03:58:06 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-A Lab Sample ID: 320-26324-3  
Client ID: MEAFF-4BMW02-0317  
Operator ID: A8-PCVA8 ALS Bottle#: 5 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

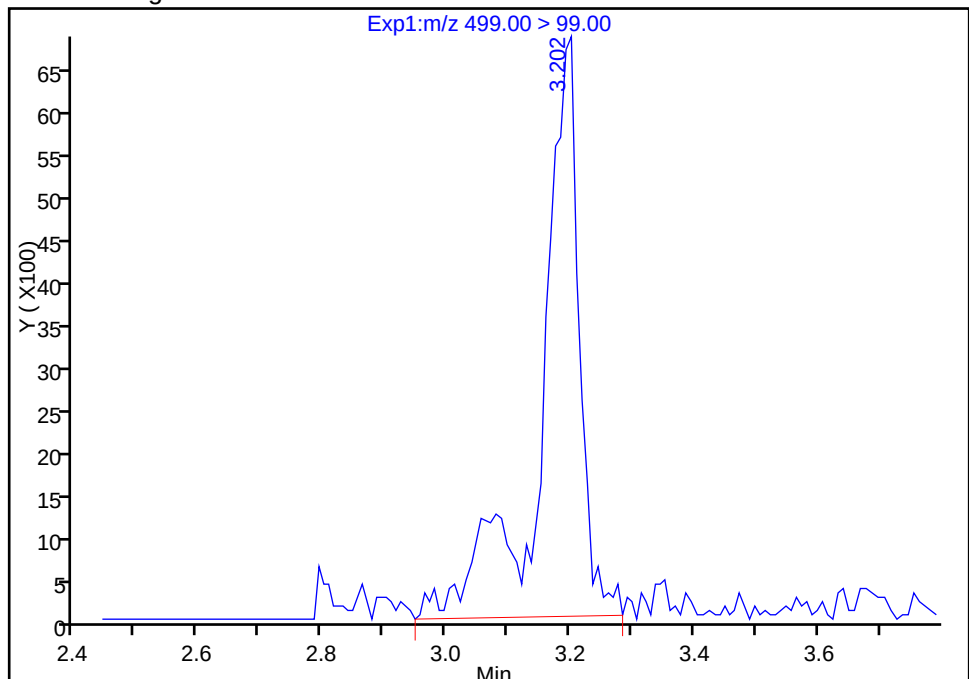
RT: 3.06  
Area: 5227  
Amount: 0.186779  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 29691  
Amount: 0.599568  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:12:22

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW03-0317 Lab Sample ID: 320-26324-4  
 Matrix: Water Lab File ID: 2017.03.11D\_071.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 15:15  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 266.9(mL) Date Analyzed: 03/12/2017 04:20  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.3 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U | 3.7 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 4.3    |   | 2.3 | 1.9 | 0.86 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 37   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 89   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 97   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_071.d  
 Lims ID: 320-26324-A-4-A  
 Client ID: MEAFF-4BMW03-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 04:20:38 ALS Bottle#: 8 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-4-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 27-Mar-2017 13:48:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK006

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:22:01

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

## 5 Perfluorobutanesulfonic acid

|                 |       |       |       |       |          |      |                 |      |        |  |
|-----------------|-------|-------|-------|-------|----------|------|-----------------|------|--------|--|
| 298.90 > 80.00  | 1.861 | 1.861 | 0.0   | 1.000 | 921026   | 2.29 |                 |      |        |  |
| 298.90 > 99.00  | 1.861 | 1.861 | 0.0   | 1.000 | 376730   |      | 2.44(0.00-0.00) |      |        |  |
| D 11 18O2 PFHxS |       |       |       |       |          |      |                 |      |        |  |
| 403.00 > 84.00  | 2.469 | 2.463 | 0.006 |       | 13026467 | 44.8 |                 | 96.7 | 487074 |  |
| D 14 13C4 PFOA  |       |       |       |       |          |      |                 |      |        |  |
| 417.00 > 372.00 | 2.819 | 2.812 | 0.007 |       | 3705021  | 18.1 |                 | 36.9 | 155315 |  |
| D 18 13C4 PFOS  |       |       |       |       |          |      |                 |      |        |  |
| 503.00 > 80.00  | 3.194 | 3.194 | 0.0   |       | 10049447 | 41.6 |                 | 88.9 | 341348 |  |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_071.d

Injection Date: 12-Mar-2017 04:20:38

Instrument ID: A8\_N

Lims ID: 320-26324-A-4-A

Lab Sample ID: 320-26324-4

Client ID: MEAFF-4BMW03-0317

Operator ID: A8-PC\A8

ALS Bottle#: 8

Worklist Smp#: 9

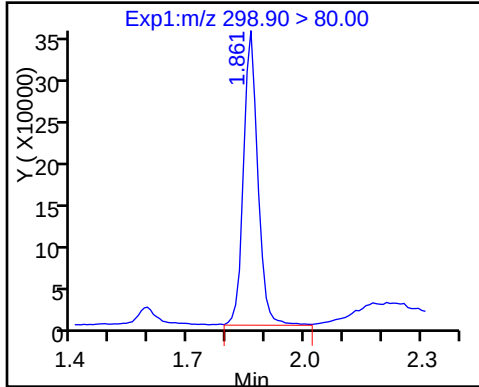
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

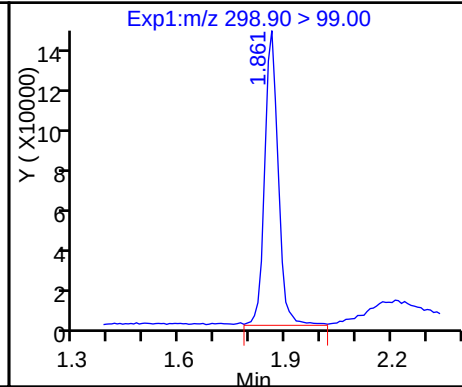
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

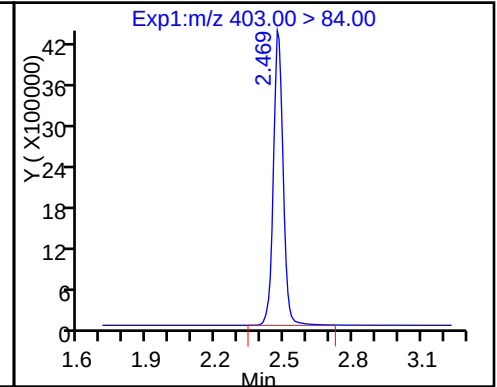
5 Perfluorobutanesulfonic acid



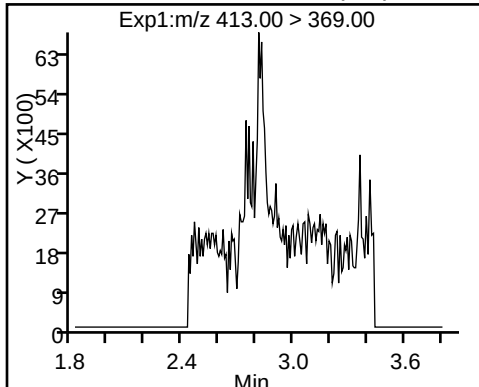
5 Perfluorobutanesulfonic acid



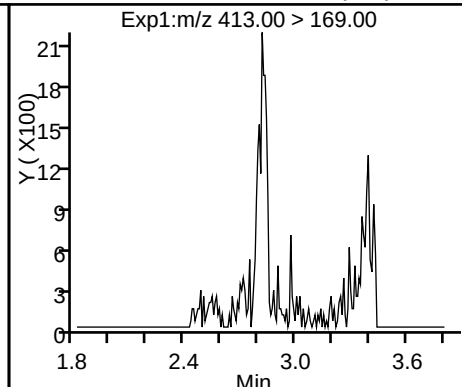
D 11 18O2 PFHxS



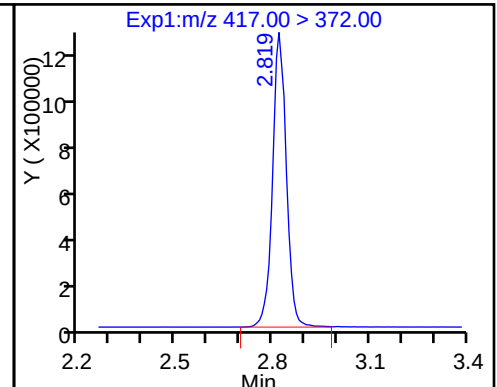
15 Perfluorooctanoic acid (ND)



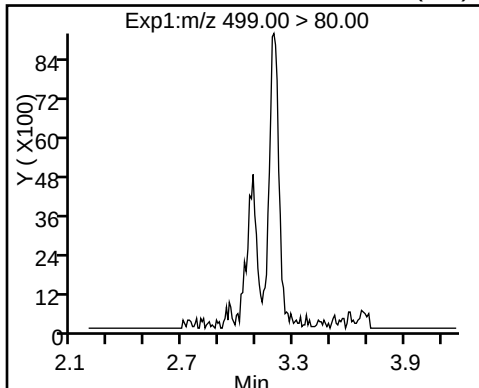
15 Perfluorooctanoic acid (ND)



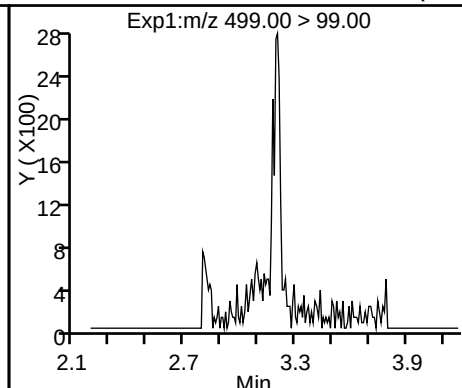
D 14 13C4 PFOA



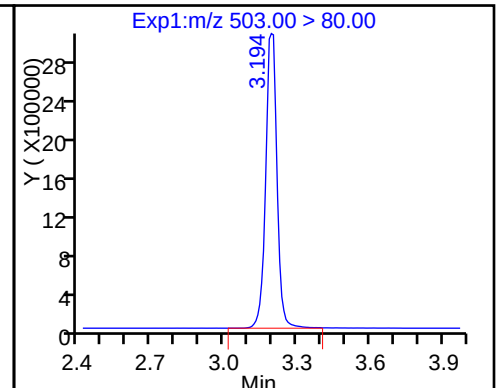
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



D 18 13C4 PFOS



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB03-GW-0317 Lab Sample ID: 320-26324-5  
 Matrix: Water Lab File ID: 2017.03.11D\_072.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 14:00  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 264.8 (mL) Date Analyzed: 03/12/2017 04:28  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.4 | 1.9 | 0.71 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U | 3.8 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U | 2.4 | 1.9 | 0.87 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 106  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 99   |   | 25-150 |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_072.d  
 Lims ID: 320-26324-A-5-A  
 Client ID: MEAFF-EB03-GW-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 04:28:08 ALS Bottle#: 9 Worklist Smp#: 10  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-5-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 27-Mar-2017 13:48:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK006

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:22:13

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

## 5 Perfluorobutanesulfonic acid

|                 |       |       |        |       |          |        |                 |      |        |  |
|-----------------|-------|-------|--------|-------|----------|--------|-----------------|------|--------|--|
| 298.90 > 80.00  | 1.863 | 1.861 | 0.002  | 1.000 | 7118     | 0.0172 |                 |      |        |  |
| 298.90 > 99.00  | 1.863 | 1.861 | 0.002  | 1.000 | 3439     |        | 2.07(0.00-0.00) |      |        |  |
| D 11 18O2 PFHxS |       |       |        |       |          |        |                 |      |        |  |
| 403.00 > 84.00  | 2.472 | 2.463 | 0.009  |       | 13389831 | 46.0   |                 | 99.4 | 415829 |  |
| D 14 13C4 PFOA  |       |       |        |       |          |        |                 |      |        |  |
| 417.00 > 372.00 | 2.815 | 2.812 | 0.003  |       | 10668743 | 52.1   |                 | 106  | 369362 |  |
| D 18 13C4 PFOS  |       |       |        |       |          |        |                 |      |        |  |
| 503.00 > 80.00  | 3.188 | 3.194 | -0.006 |       | 10193031 | 42.2   |                 | 90.1 | 439828 |  |

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_072.d

Injection Date: 12-Mar-2017 04:28:08

Instrument ID: A8\_N

Lims ID: 320-26324-A-5-A

Lab Sample ID: 320-26324-5

Client ID: MEAFF-EB03-GW-0317

Operator ID: A8-PC\A8

ALS Bottle#: 9

Worklist Smp#: 10

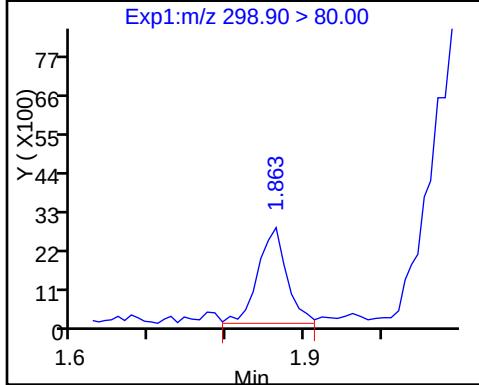
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

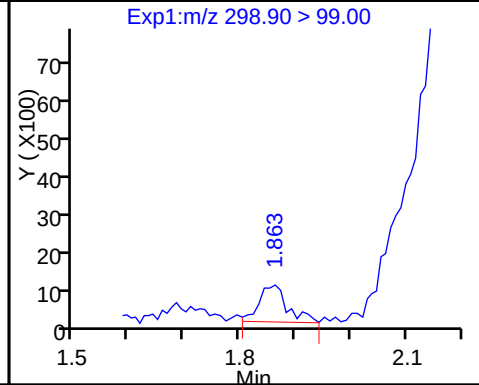
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

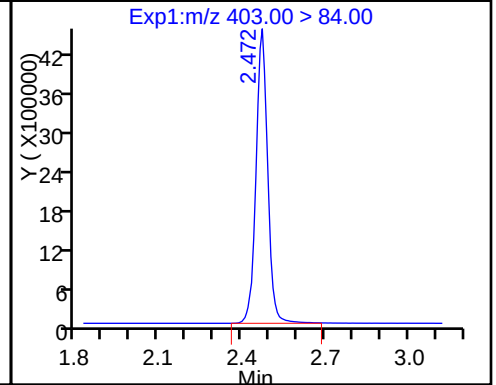
5 Perfluorobutanesulfonic acid



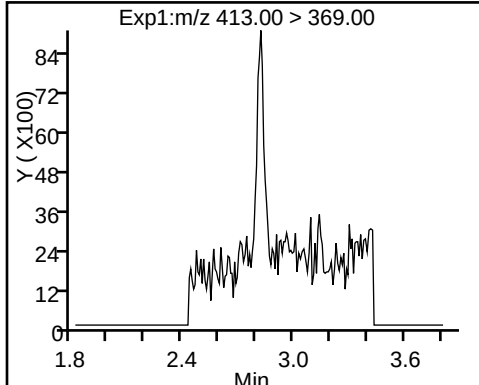
5 Perfluorobutanesulfonic acid



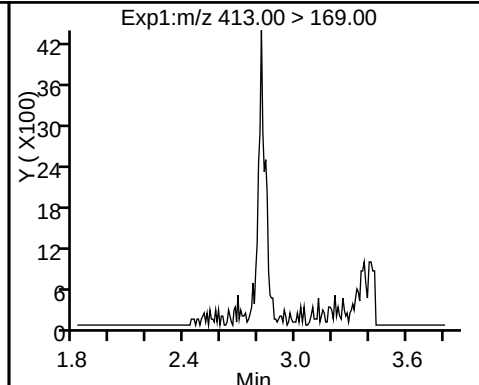
D 11 18O2 PFHxS



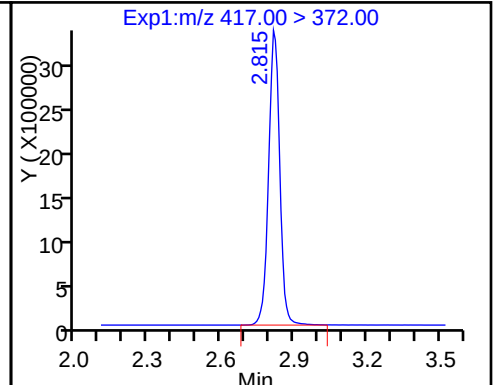
15 Perfluorooctanoic acid (ND)



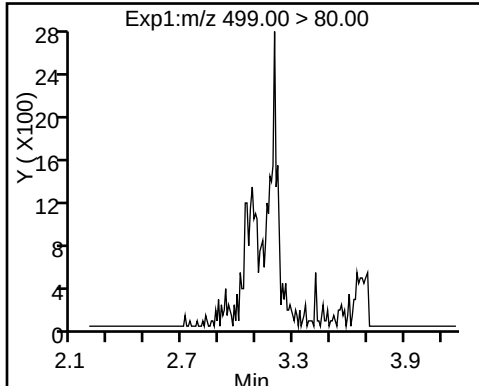
15 Perfluorooctanoic acid (ND)



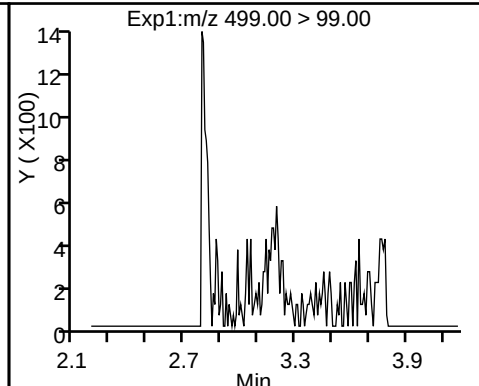
D 14 13C4 PFOA



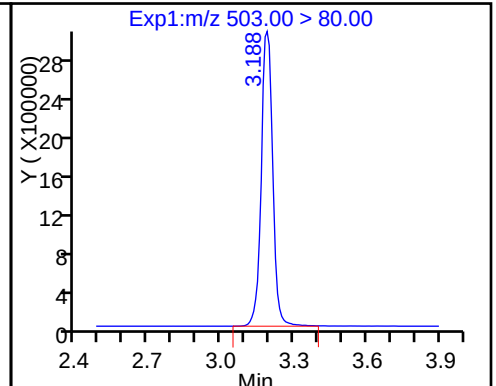
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



D 18 13C4 PFOS



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

|                                             |                                              |
|---------------------------------------------|----------------------------------------------|
| Lab Name: <u>TestAmerica Sacramento</u>     | Job No.: <u>320-26324-1</u>                  |
| SDG No.: _____                              |                                              |
| Client Sample ID: <u>MEAFF-EB04-GW-0317</u> | Lab Sample ID: <u>320-26324-6</u>            |
| Matrix: <u>Water</u>                        | Lab File ID: <u>2017.03.11D_073.d</u>        |
| Analysis Method: <u>537 (Modified)</u>      | Date Collected: <u>03/03/2017 15:35</u>      |
| Extraction Method: <u>3535</u>              | Date Extracted: <u>03/09/2017 10:15</u>      |
| Sample wt/vol: <u>260.3 (mL)</u>            | Date Analyzed: <u>03/12/2017 04:35</u>       |
| Con. Extract Vol.: <u>0.5 (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>154520</u>           | Units: <u>ng/L</u>                           |

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.4 | 1.9 | 0.72 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.9    | U | 3.8 | 2.9 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U | 2.4 | 1.9 | 0.88 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 101  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 95   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_073.d  
 Lims ID: 320-26324-A-6-A  
 Client ID: MEAFF-EB04-GW-0317  
 Sample Type: Client  
 Inject. Date: 12-Mar-2017 04:35:37 ALS Bottle#: 10 Worklist Smp#: 11  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-6-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 27-Mar-2017 13:48:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK006

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:22:25

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

5 Perfluorobutanesulfonic acid  
 298.90 > 80.00 1.871 1.861 0.010 1.000 7421 0.0187  
 298.90 > 99.00 1.861 1.861 0.0 0.995 4162 1.78(0.00-0.00)  
 D 11 18O2 PFHxS  
 403.00 > 84.00 2.483 2.463 0.020 12849503 44.2 95.4 330786  
 D 14 13C4 PFOA  
 417.00 > 372.00 2.826 2.812 0.014 10088344 49.2 101 263910  
 D 18 13C4 PFOS  
 503.00 > 80.00 3.193 3.194 -0.001 10130104 41.9 89.6 305682

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_073.d

Injection Date: 12-Mar-2017 04:35:37

Instrument ID: A8\_N

Lims ID: 320-26324-A-6-A

Lab Sample ID: 320-26324-6

Client ID: MEAFF-EB04-GW-0317

Operator ID: A8-PC\A8

ALS Bottle#: 10

Worklist Smp#: 11

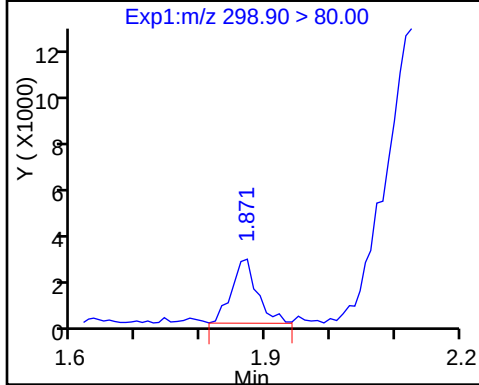
Injection Vol: 2.0 ul

Dil. Factor: 1.0000

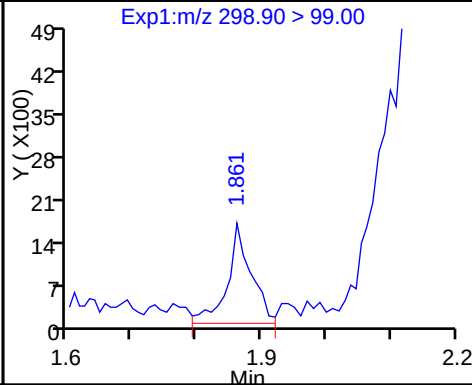
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

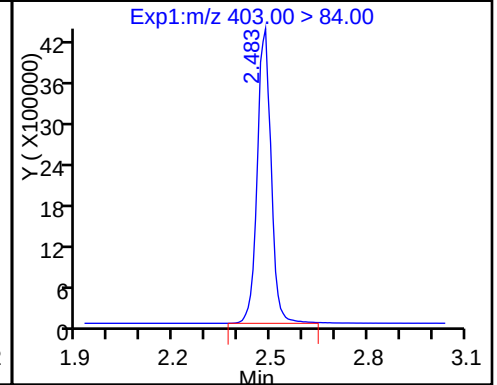
5 Perfluorobutanesulfonic acid



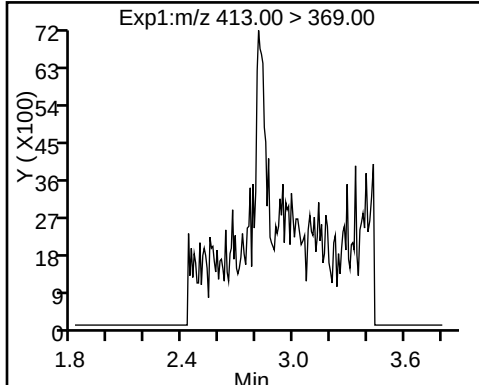
5 Perfluorobutanesulfonic acid



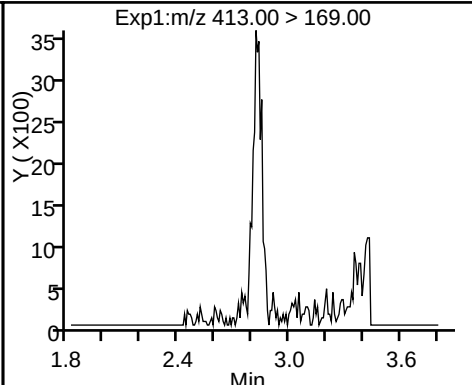
D 11 18O2 PFHxS



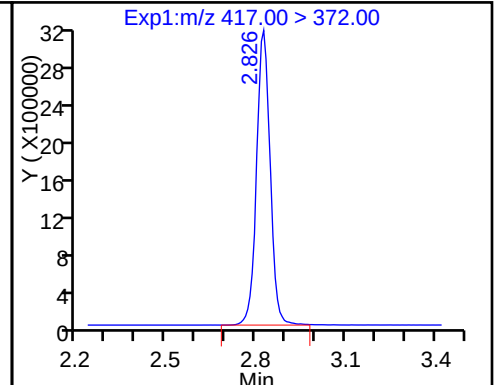
15 Perfluorooctanoic acid (ND)



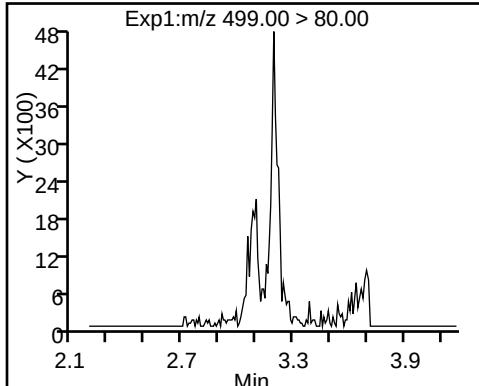
15 Perfluorooctanoic acid (ND)



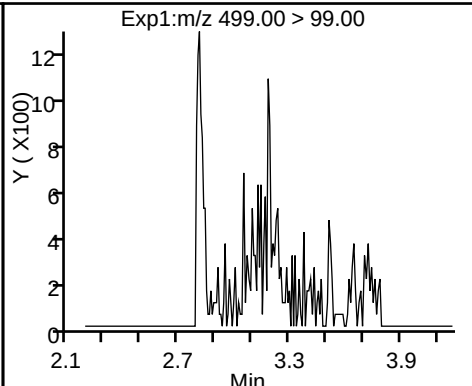
D 14 13C4 PFOA



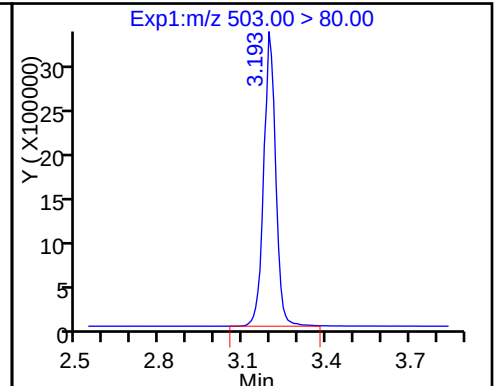
17 Perfluorooctane sulfonic acid (ND)



17 Perfluorooctane sulfonic acid (ND)



D 18 13C4 PFOS



FORM VI  
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA  
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681

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

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

Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

Calibration Files:

| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:          |
|---------|-----------------|-----------------------|
| Level 1 | IC 320-152681/2 | 2017.03.01CURVE_003.d |
| Level 2 | IC 320-152681/3 | 2017.03.01CURVE_004.d |
| Level 3 | IC 320-152681/4 | 2017.03.01CURVE_005.d |
| Level 4 | IC 320-152681/5 | 2017.03.01CURVE_006.d |
| Level 5 | IC 320-152681/6 | 2017.03.01CURVE_007.d |
| Level 6 | IC 320-152681/7 | 2017.03.01CURVE_008.d |

| ANALYTE                                                    | LVL 1 | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |  |  |  |  | RT WINDOW     | AVG RT |
|------------------------------------------------------------|-------|-------|-------|-------|-------|-------|--|--|--|--|---------------|--------|
| Perfluorobutanoic acid (PFBA)                              | 1.563 | 1.562 | 1.555 | 1.562 | 1.554 | 1.554 |  |  |  |  | 1.308 - 1.808 | 1.558  |
| Perfluoropentanoic acid (PFPeA)                            | 1.843 | 1.842 | 1.833 | 1.841 | 1.831 | 1.822 |  |  |  |  | 1.585 - 2.085 | 1.835  |
| Perfluorobutanesulfonic acid (PFBS)                        | 1.883 | 1.872 | 1.873 | 1.871 | 1.871 | 1.861 |  |  |  |  | 1.692 - 2.052 | 1.872  |
| Perfluorohexanoic acid (PFHxA)                             | 2.139 | 2.145 | 2.129 | 2.134 | 2.127 | 2.122 |  |  |  |  | 1.883 - 2.383 | 2.133  |
| Perfluoroheptanoic acid (PFHpA)                            | 2.491 | 2.484 | 2.471 | 2.471 | 2.466 | 2.461 |  |  |  |  | 2.224 - 2.724 | 2.474  |
| Perfluorohexanesulfonic acid (PFHxS)                       | ++++  | 2.500 | 2.456 | 2.487 | 2.481 | 2.478 |  |  |  |  | 2.235 - 2.735 | 2.480  |
| 6:2FTS                                                     | 2.833 | 2.818 | 2.798 | 2.806 | 2.793 | 2.797 |  |  |  |  | 2.557 - 3.057 | 2.808  |
| Perfluorooctanoic acid (PFOA)                              | ++++  | 2.841 | 2.829 | 2.837 | 2.824 | 2.820 |  |  |  |  | 2.585 - 3.085 | 2.830  |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | 2.856 | 2.857 | 2.845 | 2.837 | 2.831 | 2.828 |  |  |  |  | 2.592 - 3.092 | 2.842  |
| Perfluorooctanesulfonic acid (PFOS)                        | 3.227 | 3.105 | 3.171 | 3.093 | 3.087 | 3.186 |  |  |  |  | 2.895 - 3.395 | 3.145  |
| Perfluorononanoic acid (PFNA)                              | 3.218 | 3.209 | 3.205 | 3.205 | 3.191 | 3.186 |  |  |  |  | 2.952 - 3.452 | 3.202  |
| 8:2FTS                                                     | 3.569 | 3.561 | 3.539 | 3.539 | 3.543 | 3.523 |  |  |  |  | 3.296 - 3.796 | 3.546  |
| Perfluorodecanoic acid (PFDA)                              | 3.578 | 3.569 | 3.556 | 3.556 | 3.552 | 3.548 |  |  |  |  | 3.310 - 3.810 | 3.560  |
| Perfluorooctane Sulfonamide (FOSA)                         | 3.569 | 3.561 | 3.556 | 3.565 | 3.560 | 3.557 |  |  |  |  | 3.311 - 3.811 | 3.561  |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | 3.723 | 3.723 | 3.707 | 3.717 | 3.702 | 3.707 |  |  |  |  | 3.463 - 3.963 | 3.713  |
| Perfluorodecanesulfonic acid (PFDS)                        | 3.886 | 3.876 | 3.861 | 3.862 | 3.859 | 3.853 |  |  |  |  | 3.616 - 4.116 | 3.866  |
| Perfluoroundecanoic acid (PFUnA)                           | 3.894 | 3.885 | 3.878 | 3.879 | 3.867 | 3.862 |  |  |  |  | 3.628 - 4.128 | 3.878  |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | 3.903 | 3.885 | 3.878 | 3.888 | 3.876 | 3.871 |  |  |  |  | 3.633 - 4.133 | 3.884  |
| MeFOSA                                                     | 4.055 | 4.064 | 4.056 | 4.059 | 4.058 | 4.051 |  |  |  |  | 3.807 - 4.307 | 4.057  |
| Perfluorododecanoic acid (PFDoA)                           | 4.176 | 4.175 | 4.161 | 4.165 | 4.157 | 4.138 |  |  |  |  | 3.912 - 4.412 | 4.162  |
| N-EtFOSA-M                                                 | 4.247 | 4.246 | 4.237 | 4.249 | 4.241 | 4.236 |  |  |  |  | 3.992 - 4.492 | 4.243  |
| Perfluorotridecanoic Acid (PFTriA)                         | 4.447 | 4.430 | 4.421 | 4.418 | 4.418 | 4.407 |  |  |  |  | 4.174 - 4.674 | 4.424  |
| Perfluorotetradecanoic acid (PFTeA)                        | 4.679 | 4.667 | 4.655 | 4.652 | 4.651 | 4.635 |  |  |  |  | 4.407 - 4.907 | 4.657  |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | ++++  | 5.070 | 5.057 | 5.057 | 5.049 | 5.046 |  |  |  |  | 4.809 - 5.309 | 5.056  |
| Perfluoro-n-octadecanoic acid (PFODA)                      | 5.428 | 5.414 | 5.398 | 5.398 | 5.383 | 5.375 |  |  |  |  | 5.149 - 5.649 | 5.399  |
| 13C4 PFBA                                                  | 1.563 | 1.554 | 1.555 | 1.554 | 1.546 | 1.546 |  |  |  |  | 1.303 - 1.803 | 1.553  |
| 13C5-PFPeA                                                 | 1.843 | 1.842 | 1.833 | 1.832 | 1.821 | 1.822 |  |  |  |  | 1.582 - 2.082 | 1.832  |
| 13C2 PFHxA                                                 | 2.147 | 2.136 | 2.138 | 2.134 | 2.127 | 2.122 |  |  |  |  | 1.884 - 2.384 | 2.134  |
| 13C4-PFHpA                                                 | 2.491 | 2.484 | 2.471 | 2.479 | 2.466 | 2.461 |  |  |  |  | 2.225 - 2.725 | 2.475  |
| 18O2 PFHxS                                                 | 2.498 | 2.500 | 2.487 | 2.487 | 2.481 | 2.478 |  |  |  |  | 2.239 - 2.739 | 2.489  |
| M2-6:2FTS                                                  | 2.817 | 2.810 | 2.806 | 2.814 | 2.793 | 2.789 |  |  |  |  | 2.555 - 3.055 | 2.805  |
| 13C4 PFOA                                                  | 2.848 | 2.849 | 2.829 | 2.837 | 2.824 | 2.820 |  |  |  |  | 2.585 - 3.085 | 2.835  |
| 13C4 PFOS                                                  | 3.218 | 3.218 | 3.196 | 3.205 | 3.199 | 3.186 |  |  |  |  | 2.954 - 3.454 | 3.204  |

FORM VI  
LCMS BY EXTERNAL STANDARD - INITIAL CALIBRATION DATA  
RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N  
 Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| ANALYTE      | LVL 1 | LVL 2 | LVL 3 | LVL 4 | LVL 5 | LVL 6 |  |  |  |  | RT WINDOW     | AVG RT |
|--------------|-------|-------|-------|-------|-------|-------|--|--|--|--|---------------|--------|
| 13C5 PFNA    | 3.218 | 3.218 | 3.205 | 3.214 | 3.199 | 3.195 |  |  |  |  | 2.958 - 3.458 | 3.208  |
| M2-8:2FTS    | 3.569 | 3.553 | 3.548 | 3.539 | 3.535 | 3.523 |  |  |  |  | 3.295 - 3.795 | 3.545  |
| 13C8 FOSA    | 3.561 | 3.561 | 3.556 | 3.565 | 3.560 | 3.548 |  |  |  |  | 3.309 - 3.809 | 3.559  |
| 13C2 PFDA    | 3.569 | 3.569 | 3.556 | 3.565 | 3.552 | 3.548 |  |  |  |  | 3.310 - 3.810 | 3.560  |
| d3-NMeFOSAA  | 3.723 | 3.723 | 3.707 | 3.707 | 3.702 | 3.696 |  |  |  |  | 3.460 - 3.960 | 3.710  |
| d5-NEtFOSAA  | 3.894 | 3.885 | 3.869 | 3.870 | 3.867 | 3.862 |  |  |  |  | 3.625 - 4.125 | 3.875  |
| 13C2 PFUnA   | 3.894 | 3.885 | 3.869 | 3.879 | 3.867 | 3.862 |  |  |  |  | 3.626 - 4.126 | 3.876  |
| d-N-MeFOSA-M | 4.055 | 4.055 | 4.047 | 4.050 | 4.048 | 4.042 |  |  |  |  | 3.800 - 4.300 | 4.050  |
| 13C2 PFDoA   | 4.176 | 4.175 | 4.161 | 4.165 | 4.157 | 4.152 |  |  |  |  | 3.914 - 4.414 | 4.164  |
| d-N-EtFOSA-M | 4.238 | 4.237 | 4.228 | 4.240 | 4.241 | 4.227 |  |  |  |  | 3.985 - 4.485 | 4.235  |
| 13C2-PFTeDA  | 4.679 | 4.667 | 4.655 | 4.652 | 4.641 | 4.635 |  |  |  |  | 4.405 - 4.905 | 4.655  |
| 13C2-PFHxDA  | 5.077 | 5.070 | 5.057 | 5.057 | 5.049 | 5.035 |  |  |  |  | 4.807 - 5.307 | 5.058  |

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

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681

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

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

Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

Calibration Files:

|         |                 |                       |
|---------|-----------------|-----------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:          |
| Level 1 | IC 320-152681/2 | 2017.03.01CURVE_003.d |
| Level 2 | IC 320-152681/3 | 2017.03.01CURVE_004.d |
| Level 3 | IC 320-152681/4 | 2017.03.01CURVE_005.d |
| Level 4 | IC 320-152681/5 | 2017.03.01CURVE_006.d |
| Level 5 | IC 320-152681/6 | 2017.03.01CURVE_007.d |
| Level 6 | IC 320-152681/7 | 2017.03.01CURVE_008.d |

| ANALYTE     | CF               |                  |        |        | CURVE<br>TYPE | COEFFICIENT |            |    | # | MIN CF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|-------------|------------------|------------------|--------|--------|---------------|-------------|------------|----|---|--------|------|---|-------------|---------------|---|-------------------|
|             | LVL 1<br>LVL 5   | LVL 2<br>LVL 6   | LVL 3  | LVL 4  |               | B           | M1         | M2 |   |        |      |   |             |               |   |                   |
| 13C4 PFBA   | 295570<br>298823 | 282103<br>245371 | 289131 | 342453 | Ave           |             | 292241.860 |    |   |        | 10.7 |   | 50.0        |               |   |                   |
| 13C5-PFPeA  | 243840<br>228800 | 230536<br>186413 | 230743 | 272822 | Ave           |             | 232192.393 |    |   |        | 12.0 |   | 50.0        |               |   |                   |
| 13C2 PFHxA  | 216513<br>214399 | 203387<br>180899 | 205221 | 244884 | Ave           |             | 210883.903 |    |   |        | 9.9  |   | 50.0        |               |   |                   |
| 13C4-PFHpA  | 196625<br>198881 | 194053<br>153158 | 196340 | 218699 | Ave           |             | 192959.403 |    |   |        | 11.1 |   | 50.0        |               |   |                   |
| 18O2 PFHxS  | 303886<br>295000 | 286708<br>235682 | 287749 | 336370 | Ave           |             | 290899.232 |    |   |        | 11.2 |   | 50.0        |               |   |                   |
| M2-6:2FTS   | 77170<br>76852   | 74128<br>71775   | 76996  | 86146  | Ave           |             | 77177.6947 |    |   |        | 6.3  |   | 50.0        |               |   |                   |
| 13C4 PFOA   | 218643<br>200396 | 211258<br>153770 | 209474 | 236176 | Ave           |             | 204953.003 |    |   |        | 13.6 |   | 50.0        |               |   |                   |
| 13C4 PFOS   | 248546<br>248262 | 230373<br>208908 | 237852 | 275881 | Ave           |             | 241637.026 |    |   |        | 9.2  |   | 50.0        |               |   |                   |
| 13C5 PFNA   | 187340<br>178740 | 181023<br>139672 | 176430 | 203992 | Ave           |             | 177866.177 |    |   |        | 11.9 |   | 50.0        |               |   |                   |
| M2-8:2FTS   | 96352<br>91038   | 94980<br>76400   | 95104  | 101739 | Ave           |             | 92601.9868 |    |   |        | 9.3  |   | 50.0        |               |   |                   |
| 13C8 FOSA   | 389836<br>371174 | 361792<br>303762 | 377175 | 397768 | Ave           |             | 366917.947 |    |   |        | 9.1  |   | 50.0        |               |   |                   |
| 13C2 PFDA   | 175335<br>161485 | 171862<br>124531 | 173776 | 193236 | Ave           |             | 166704.327 |    |   |        | 13.8 |   | 50.0        |               |   |                   |
| d3-NMeFOSAA | 80206<br>88198   | 79979<br>82300   | 85034  | 95399  | Ave           |             | 85185.7867 |    |   |        | 6.9  |   | 50.0        |               |   |                   |
| d5-NEtFOSAA | 85322<br>82165   | 81954<br>62458   | 86013  | 90318  | Ave           |             | 81371.4600 |    |   |        | 12.0 |   | 50.0        |               |   |                   |
| 13C2 PFUnA  | 144662<br>128397 | 134819<br>95431  | 134602 | 146921 | Ave           |             | 130805.323 |    |   |        | 14.3 |   | 50.0        |               |   |                   |

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



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

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3 (mm) Heated Purge: (Y/N) N  
 Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| ANALYTE      | CF               |                  |        |        | CURVE<br>TYPE | COEFFICIENT |            |    | # | MIN CF | %RSD | # | MAX<br>%RSD | R^2<br>OR COD | # | MIN R^2<br>OR COD |
|--------------|------------------|------------------|--------|--------|---------------|-------------|------------|----|---|--------|------|---|-------------|---------------|---|-------------------|
|              | LVL 1<br>LVL 5   | LVL 2<br>LVL 6   | LVL 3  | LVL 4  |               | B           | M1         | M2 |   |        |      |   |             |               |   |                   |
| d-N-MeFOSA-M | 86833<br>90989   | 81090<br>88671   | 88728  | 91589  | Ave           |             | 87983.4500 |    |   |        | 4.3  |   | 50.0        |               |   |                   |
| 13C2 PFDoA   | 134509<br>123176 | 120646<br>106418 | 126789 | 132125 | Ave           |             | 123944.073 |    |   |        | 8.1  |   | 50.0        |               |   |                   |
| d-N-EtFOSA-M | 83930<br>87690   | 78408<br>88518   | 85474  | 87472  | Ave           |             | 85248.5033 |    |   |        | 4.4  |   | 50.0        |               |   |                   |
| 13C2-PFTeDA  | 274175<br>265148 | 246188<br>227078 | 269935 | 272468 | Ave           |             | 259165.203 |    |   |        | 7.2  |   | 50.0        |               |   |                   |
| 13C2-PFHxDA  | 131614<br>132135 | 114843<br>117588 | 127568 | 126617 | Ave           |             | 125060.687 |    |   |        | 5.8  |   | 50.0        |               |   |                   |

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

FORM VI  
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA  
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681  
SDG No.: \_\_\_\_\_  
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N  
Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| 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 |   |         |      |   |             |               |   |                   |
| Perfluorobutanoic acid (PFBA)                                 | 0.8141<br>0.7696 | 0.8385 | 0.8902 | 0.8682 | 0.9030 | AveID         |             | 0.8473 |    |   |         | 5.9  |   | 35.0        |               |   |                   |
| Perfluoropentanoic acid (PFPeA)                               | 1.0168<br>0.8556 | 1.0140 | 1.0095 | 0.9684 | 1.0070 | AveID         |             | 0.9785 |    |   |         | 6.4  |   | 35.0        |               |   |                   |
| Perfluorobutanesulfonic acid (PFBS)                           | 1.4512<br>1.1477 | 1.4372 | 1.5643 | 1.5194 | 1.4753 | AveID         |             | 1.4325 |    |   |         | 10.3 |   | 50.0        |               |   |                   |
| Perfluorohexanoic acid (PFHxA)                                | 0.8937<br>0.8394 | 0.9003 | 0.9420 | 0.8558 | 0.9058 | AveID         |             | 0.8895 |    |   |         | 4.1  |   | 35.0        |               |   |                   |
| Perfluoroheptanoic acid (PFHpA)                               | 1.0535<br>0.9266 | 0.9536 | 0.9588 | 0.9499 | 0.9613 | AveID         |             | 0.9673 |    |   |         | 4.5  |   | 35.0        |               |   |                   |
| Perfluorohexanesulfonic acid (PFHxS)                          | ++++<br>0.9823   | 1.1299 | 1.0303 | 0.9734 | 1.0264 | AveID         |             | 1.0284 |    |   |         | 6.0  |   | 35.0        |               |   |                   |
| 6:2FTS                                                        | 1.1310<br>0.8276 | 1.0222 | 0.9530 | 0.9038 | 0.8939 | L2ID          | 0.1204      | 0.8859 |    |   |         |      |   |             | 0.9980        |   | 0.9900            |
| Perfluorooctanoic acid (PFOA)                                 | ++++<br>0.9671   | 1.0714 | 1.0527 | 0.9847 | 1.0323 | AveID         |             | 1.0217 |    |   |         | 4.3  |   | 35.0        |               |   |                   |
| Perfluoroheptanesulfonic Acid (PFHpS)                         | 0.9372<br>0.9122 | 1.0436 | 1.1203 | 1.0793 | 1.0932 | AveID         |             | 1.0310 |    |   |         | 8.4  |   | 50.0        |               |   |                   |
| Perfluorooctanesulfonic acid (PFOS)                           | 0.9378<br>1.0254 | 0.9696 | 0.9901 | 0.9549 | 1.0231 | AveID         |             | 0.9835 |    |   |         | 3.7  |   | 35.0        |               |   |                   |
| Perfluorononanoic acid (PFNA)                                 | 0.8479<br>0.9328 | 0.8440 | 0.9730 | 0.8905 | 0.9356 | AveID         |             | 0.9040 |    |   |         | 5.8  |   | 35.0        |               |   |                   |
| 8:2FTS                                                        | 1.0958<br>0.8348 | 0.9785 | 0.9767 | 0.9909 | 0.9344 | L2ID          | 0.0783      | 0.9239 |    |   |         |      |   |             | 0.9960        |   | 0.9900            |
| Perfluorodecanoic acid (PFDA)                                 | 0.8578<br>0.9743 | 0.8868 | 0.9034 | 0.8481 | 0.9635 | AveID         |             | 0.9057 |    |   |         | 5.8  |   | 35.0        |               |   |                   |
| Perfluorooctane Sulfonamide (FOSA)                            | 0.8943<br>0.7850 | 0.9384 | 0.9267 | 0.9035 | 0.9430 | AveID         |             | 0.8985 |    |   |         | 6.5  |   | 35.0        |               |   |                   |
| N-methyl perfluorooctane<br>sulfonamidoacetic acid (NMeFOSAA) | 1.0472<br>0.9897 | 0.9816 | 0.9980 | 0.8887 | 0.9213 | AveID         |             | 0.9711 |    |   |         | 5.9  |   | 35.0        |               |   |                   |
| Perfluorodecanesulfonic acid (PFDS)                           | 0.5889<br>0.6126 | 0.5647 | 0.6260 | 0.5646 | 0.6173 | AveID         |             | 0.5957 |    |   |         | 4.5  |   | 50.0        |               |   |                   |
| Perfluoroundecanoic acid (PFUnA)                              | 1.1887<br>0.9783 | 1.0233 | 1.0049 | 0.8914 | 0.9951 | AveID         |             | 1.0136 |    |   |         | 9.6  |   | 35.0        |               |   |                   |
| N-ethyl perfluorooctane<br>sulfonamidoacetic acid (NEtFOSAA)  | 0.9144<br>0.9531 | 0.9405 | 0.8966 | 0.8892 | 0.8680 | AveID         |             | 0.9103 |    |   |         | 3.5  |   | 35.0        |               |   |                   |
| MeFOSA                                                        | 1.0035<br>0.9709 | 0.9265 | 0.9122 | 0.9123 | 0.8877 | AveID         |             | 0.9355 |    |   |         | 4.6  |   | 35.0        |               |   |                   |

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

FORM VI  
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA  
CURVE EVALUATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N  
 Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| 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 |   |         |      |   |             |               |   |                   |
| Perfluorododecanoic acid (PFDoA)       | 0.8688<br>0.9119 | 0.9386 | 0.9128 | 0.8906 | 0.9644 | AveID         |             | 0.9145 |    |   |         | 3.7  |   | 35.0        |               |   |                   |
| N-EtFOSA-M                             | 1.0272<br>0.9831 | 1.0085 | 0.9951 | 0.9583 | 0.9298 | AveID         |             | 0.9837 |    |   |         | 3.6  |   | 35.0        |               |   |                   |
| Perfluorotridecanoic Acid (PFTriA)     | 0.8807<br>0.8636 | 0.8542 | 0.8873 | 0.8354 | 0.9194 | AveID         |             | 0.8734 |    |   |         | 3.3  |   | 50.0        |               |   |                   |
| Perfluorotetradecanoic acid (PFTeA)    | 1.9494<br>1.8544 | 1.9776 | 2.0893 | 1.8773 | 2.0509 | AveID         |             | 1.9665 |    |   |         | 4.7  |   | 50.0        |               |   |                   |
| Perfluoro-n-hexadecanoic acid (PFHxDA) | ++++<br>0.9462   | 1.4217 | 1.0035 | 0.7837 | 0.9248 | LlID          | 0.3491      | 0.9270 |    |   |         |      |   |             | 0.9970        |   | 0.9900            |
| Perfluoro-n-octadecanoic acid (PFODA)  | 0.6950<br>0.8378 | 0.6764 | 0.7116 | 0.6387 | 0.7456 | AveID         |             | 0.7175 |    |   |         | 9.6  |   | 50.0        |               |   |                   |

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681

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

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

Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

Calibration Files:

|         |                 |                       |
|---------|-----------------|-----------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:          |
| Level 1 | IC 320-152681/2 | 2017.03.01CURVE_003.d |
| Level 2 | IC 320-152681/3 | 2017.03.01CURVE_004.d |
| Level 3 | IC 320-152681/4 | 2017.03.01CURVE_005.d |
| Level 4 | IC 320-152681/5 | 2017.03.01CURVE_006.d |
| Level 5 | IC 320-152681/6 | 2017.03.01CURVE_007.d |
| Level 6 | IC 320-152681/7 | 2017.03.01CURVE_008.d |

| ANALYTE      | 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 |
| 13C4 PFBA    | Ave           | 14778495<br>12268568 | 14105138 | 14456536 | 17122661 | 14941160 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C5-PFPeA   | Ave           | 12192014<br>9320645  | 11526786 | 11537165 | 13641103 | 11440005 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C2 PFHxA   | Ave           | 10825655<br>9044966  | 10169363 | 10261028 | 12244217 | 10719942 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C4-PFHpA   | Ave           | 9831264<br>7657909   | 9702633  | 9817002  | 10934944 | 9944069  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 18O2 PFHxS   | Ave           | 14373798<br>11147782 | 13561303 | 13610529 | 15910284 | 13953506 | 47.3<br>47.3          | 47.3  | 47.3  | 47.3  | 47.3  |
| M2-6:2FTS    | Ave           | 3665572<br>3409307   | 3521088  | 3657293  | 4091935  | 3650448  | 47.5<br>47.5          | 47.5  | 47.5  | 47.5  | 47.5  |
| 13C4 PFOA    | Ave           | 10932126<br>7688496  | 10562914 | 10473721 | 11808824 | 10019820 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C4 PFOS    | Ave           | 11880498<br>9985826  | 11011810 | 11369327 | 13187105 | 11866933 | 47.8<br>47.8          | 47.8  | 47.8  | 47.8  | 47.8  |
| 13C5 PFNA    | Ave           | 9367003<br>6983620   | 9051156  | 8821496  | 10199601 | 8936977  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| M2-8:2FTS    | Ave           | 4615245<br>3659550   | 4549526  | 4555474  | 4873285  | 4360731  | 47.9<br>47.9          | 47.9  | 47.9  | 47.9  | 47.9  |
| 13C8 FOSA    | Ave           | 19491823<br>15188110 | 18089578 | 18858766 | 19888389 | 18558718 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C2 PFDA    | Ave           | 8766735<br>6226569   | 8593124  | 8688810  | 9661817  | 8074243  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| d3-NMeFOSAA  | Ave           | 4010288<br>4115011   | 3998931  | 4251681  | 4769931  | 4409894  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| d5-NETFOSAA  | Ave           | 4266080<br>3122900   | 4097675  | 4300641  | 4515915  | 4108227  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C2 PFUnA   | Ave           | 7233118<br>4771549   | 6740958  | 6730080  | 7346047  | 6419845  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| d-N-MeFOSA-M | Ave           | 4341649<br>4433562   | 4054503  | 4436424  | 4579449  | 4549448  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |

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

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681

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

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

Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| ANALYTE      | 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 |
| 13C2 PFDoA   | Ave           | 6725474<br>5320903   | 6032319  | 6339474  | 6606261  | 6158791  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| d-N-EtFOSA-M | Ave           | 4196476<br>4425922   | 3920378  | 4273681  | 4373613  | 4384481  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C2-PFTeDA  | Ave           | 13708730<br>11353892 | 12309406 | 13496732 | 13623388 | 13257413 | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |
| 13C2-PFHxDA  | Ave           | 6580685<br>5879424   | 5742128  | 6378393  | 6330845  | 6606731  | 50.0<br>50.0          | 50.0  | 50.0  | 50.0  | 50.0  |

Curve Type Legend:

Ave = Average

FORM VI  
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681

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

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

Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

Calibration Files:

|         |                 |                       |
|---------|-----------------|-----------------------|
| LEVEL:  | LAB SAMPLE ID:  | LAB FILE ID:          |
| Level 1 | IC 320-152681/2 | 2017.03.01CURVE_003.d |
| Level 2 | IC 320-152681/3 | 2017.03.01CURVE_004.d |
| Level 3 | IC 320-152681/4 | 2017.03.01CURVE_005.d |
| Level 4 | IC 320-152681/5 | 2017.03.01CURVE_006.d |
| Level 5 | IC 320-152681/6 | 2017.03.01CURVE_007.d |
| Level 6 | IC 320-152681/7 | 2017.03.01CURVE_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 |
| Perfluorobutanoic acid (PFBA)                                 |           | AveID         | 120309<br>37767596 | 236552 | 1286888 | 5946494 | 13491384 | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluoropentanoic acid (PFPeA)                               |           | AveID         | 123967<br>31900088 | 233761 | 1164625 | 5283919 | 11520213 | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorobutanesulfonic acid (PFBS)                           |           | AveID         | 194922<br>47824719 | 364249 | 1989498 | 9035699 | 19236596 | 0.442<br>177          | 0.884 | 4.42  | 17.7  | 44.2  |
| Perfluorohexanoic acid (PFHxA)                                |           | AveID         | 96748<br>30367858  | 183108 | 966638  | 4191655 | 9710439  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluoroheptanoic acid (PFHpA)                               |           | AveID         | 103569<br>28382869 | 185040 | 941301  | 4154809 | 9559143  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorohexanesulfonic acid<br>(PFHxS)                       |           | AveID         | ++++<br>42133990   | 294799 | 1348890 | 5958886 | 13776740 | ++++<br>182           | 0.910 | 4.55  | 18.2  | 45.5  |
| 6:2FTS                                                        |           | L2ID          | 41369<br>11262289  | 71833  | 347809  | 1476276 | 3256270  | 0.474<br>190          | 0.948 | 4.74  | 19.0  | 47.4  |
| Perfluorooctanoic acid (PFOA)                                 |           | AveID         | ++++<br>29743583   | 226350 | 1102619 | 4651144 | 10343315 | ++++<br>200           | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluoroheptanesulfonic Acid<br>(PFHpS)                      |           | AveID         | 110873<br>36282267 | 228885 | 1268398 | 5669268 | 12919018 | 0.476<br>190          | 0.952 | 4.76  | 19.0  | 47.6  |
| Perfluorooctanesulfonic acid (PFOS)                           |           | AveID         | 108156<br>39756569 | 207277 | 1092724 | 4889351 | 11786011 | 0.464<br>186          | 0.928 | 4.64  | 18.6  | 46.4  |
| Perfluorononanoic acid (PFNA)                                 |           | AveID         | 79419<br>26057481  | 152789 | 858327  | 3633207 | 8361339  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| 8:2FTS                                                        |           | L2ID          | 50574<br>12220206  | 89032  | 444929  | 1931499 | 4074481  | 0.479<br>192          | 0.958 | 4.79  | 19.2  | 47.9  |
| Perfluorodecanoic acid (PFDA)                                 |           | AveID         | 75200<br>24265114  | 152408 | 784974  | 3277760 | 7779706  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorooctane Sulfonamide (FOSA)                            |           | AveID         | 174325<br>47690261 | 339522 | 1747629 | 7187955 | 17500489 | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| N-methyl perfluorooctane<br>sulfonamidoacetic acid (NMeFOSAA) |           | AveID         | 41996<br>16290792  | 78506  | 424299  | 1695690 | 4062831  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorodecanesulfonic acid (PFDS)                           |           | AveID         | 70554<br>24675284  | 125403 | 717648  | 3002868 | 7386234  | 0.482<br>193          | 0.964 | 4.82  | 19.3  | 48.2  |

FORM VI  
LCMS BY ISOTOPIC DILUTION - INITIAL CALIBRATION DATA  
RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1 Analy Batch No.: 152681  
SDG No.: \_\_\_\_\_  
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N  
Calibration Start Date: 03/01/2017 11:08 Calibration End Date: 03/01/2017 11:46 Calibration ID: 28659

| 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 |
| Perfluoroundecanoic acid (PFUnA)                             |           | AveID         | 85977<br>18672321  | 137967 | 676308  | 2619295 | 6388091  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| N-ethyl perfluorooctane<br>sulfonamidoacetic acid (NEtFOSAA) |           | AveID         | 39009<br>11906031  | 77078  | 385576  | 1606146 | 3565748  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| MeFOSA                                                       |           | AveID         | 43568<br>17219029  | 75129  | 404698  | 1671133 | 4038740  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorododecanoic acid (PFDoA)                             |           | AveID         | 58428<br>19408225  | 113238 | 578671  | 2353395 | 5939325  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| N-EtFOSA-M                                                   |           | AveID         | 43107<br>17404238  | 79073  | 425282  | 1676481 | 4076562  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorotridecanoic Acid (PFTriA)                           |           | AveID         | 59233<br>18379771  | 103052 | 562473  | 2207561 | 5662375  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluorotetradecanoic acid (PFTeA)                          |           | AveID         | 131104<br>39468467 | 238596 | 1324493 | 4960846 | 12631200 | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluoro-n-hexadecanoic acid<br>(PFHxDA)                    |           | L1ID          | ++++<br>20137749   | 171523 | 636153  | 2071027 | 5695645  | ++++<br>200           | 1.00  | 5.00  | 20.0  | 50.0  |
| Perfluoro-n-octadecanoic acid<br>(PFODA)                     |           | AveID         | 46744<br>17831844  | 81601  | 451116  | 1687895 | 4591929  | 0.500<br>200          | 1.00  | 5.00  | 20.0  | 50.0  |

Curve Type Legend:

AveID = Average isotope dilution  
L1ID = Linear 1/conc IsoDil  
L2ID = Linear 1/conc^2 IsoDil

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_003.d  
 Lims ID: IC L1 Full  
 Client ID:  
 Sample Type: IC Calib Level: 1  
 Inject. Date: 01-Mar-2017 11:08:52 ALS Bottle#: 28 Worklist Smp#: 2  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L1-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:05 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 12:00:05

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

D 1 13C4 PFBA

217.00 > 172.00 1.563 1.553 0.010 14778495 50.6 101 654817

2 Perfluorobutyric acid

212.90 > 169.00 1.563 1.558 0.005 1.000 120309 0.4804 96.1 1068

D 3 13C5-PFPeA

267.90 > 223.00 1.843 1.832 0.011 12192014 52.5 105 525740

4 Perfluoropentanoic acid

262.90 > 219.00 1.843 1.835 0.008 1.000 123967 0.5195 104 1065

5 Perfluorobutanesulfonic acid

298.90 > 80.00 1.883 1.872 0.011 1.000 194922 0.4478 101

298.90 > 99.00 1.883 1.872 0.011 1.000 77860 2.50(0.00-0.00) 101

6 Perfluorohexanoic acid

313.00 > 269.00 2.139 2.133 0.006 1.000 96748 0.5024 100 3614

D 7 13C2 PFHxA

315.00 > 270.00 2.147 2.134 0.013 10825655 51.3 103 238427

10 Perfluoroheptanoic acid

363.00 > 319.00 2.491 2.474 0.017 1.000 103569 0.5446 109 891

D 9 13C4-PFHpA

367.00 > 322.00 2.491 2.475 0.016 9831264 50.9 102 345749

8 Perfluorohexanesulfonic acid

399.00 > 80.00 2.506 2.485 0.021 1.000 182218 0.5830 128 M

D 11 18O2 PFHxS

403.00 > 84.00 2.498 2.489 0.009 14373798 49.4 104 411887

D 12 M2-6:2FTS

429.00 > 409.00 2.817 2.805 0.012 3665572 47.5 100.0

13 Sodium 1H,1H,2H,2H-perfluorooctane

427.00 > 407.00 2.833 2.807 0.026 1.000 41369 0.4692 99.0



| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        | M     |
| 413.00 > 369.00                       | 2.856 | 2.835  | 0.021  | 1.000  | 120388   | 0.5389       |                 | 108  | 1162   |       |
| 413.00 > 169.00                       | 2.848 | 2.835  | 0.013  | 0.997  | 71985    |              | 1.67(0.90-1.10) | 108  | 2853   | M     |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.848 | 2.835  | 0.013  |        | 10932126 | 53.3         |                 | 107  | 336385 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.856 | 2.842  | 0.014  | 1.000  | 110873   | 0.4327       |                 | 90.9 |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        | M     |
| 499.00 > 80.00                        | 3.227 | 3.145  | 0.082  | 1.000  | 108156   | 0.4425       |                 | 95.4 | 8683   | M     |
| 499.00 > 99.00                        | 3.218 | 3.145  | 0.073  | 0.997  | 27348    |              | 3.95(0.90-1.10) | 95.4 | 2308   |       |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.218 | 3.202  | 0.016  | 1.000  | 79419    | 0.4690       |                 | 93.8 | 1607   |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.218 | 3.204  | 0.014  |        | 11880498 | 49.2         |                 | 103  | 335475 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.218 | 3.208  | 0.010  |        | 9367003  | 52.7         |                 | 105  | 245715 |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.569 | 3.545  | 0.024  |        | 4615245  | 49.8         |                 | 104  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.569 | 3.546  | 0.023  | 1.000  | 50574    | 0.4834       |                 | 101  |        |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.561 | 3.559  | 0.002  |        | 19491823 | 53.1         |                 | 106  | 285934 |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.578 | 3.560  | 0.018  | 1.000  | 75200    | 0.4736       |                 | 94.7 | 2610   |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.569 | 3.560  | 0.009  |        | 8766735  | 52.6         |                 | 105  | 186190 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.569 | 3.561  | 0.008  | 1.000  | 174325   | 0.4977       |                 | 99.5 | 18811  |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.723 | 3.710  | 0.013  |        | 4010288  | 47.1         |                 | 94.2 |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.723 | 3.713  | 0.010  | 1.000  | 41996    | 0.5392       |                 | 108  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.886 | 3.866  | 0.020  | 1.000  | 70554    | 0.4765       |                 | 98.9 |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.894 | 3.875  | 0.019  |        | 4266080  | 52.4         |                 | 105  |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.894 | 3.876  | 0.018  |        | 7233118  | 55.3         |                 | 111  | 181410 |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.894 | 3.878  | 0.016  | 1.000  | 85977    | 0.5863       |                 | 117  | 2231   |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.903 | 3.883  | 0.020  | 1.002  | 39009    | 0.5023       |                 | 100  |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.055 | 4.050  | 0.005  |        | 4341649  | 49.3         |                 | 98.7 |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.055 | 4.057  | -0.002 | 1.000  | 43568    | 0.5363       |                 | 107  |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.176 | 4.162  | 0.014  | 1.000  | 58428    | 0.4750       |                 | 95.0 | 471    |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.176 | 4.164     | 0.012     |           | 6725474  | 54.3            |                 | 109  | 175924 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.238 | 4.235     | 0.003     |           | 4196476  | 49.2            |                 | 98.5 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.247 | 4.242     | 0.005     | 1.000     | 43107    | 0.5221          |                 | 104  |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.447 | 4.424     | 0.023     | 1.000     | 59233    | 0.5042          |                 | 101  | 1171   |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.679 | 4.655     | 0.024     |           | 13708730 | 52.9            |                 | 106  | 527093 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.679 | 4.657     | 0.022     | 1.000     | 131104   | 0.4956          |                 | 99.1 | 372    |       |
| 713.00 > 169.00                       | 4.670 | 4.657     | 0.013     | 0.998     | 21850    |                 | 6.00(0.00-0.00) | 99.1 | 7867   |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.077 | 5.057     | 0.020     |           | 6580685  | 52.6            |                 | 105  | 118608 |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.077 | 5.059     | 0.018     | 1.000     | 146592   | 0.7991          |                 | 160  | 190    |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.428 | 5.399     | 0.029     | 1.000     | 46744    | 0.4843          |                 | 96.9 | 91.5   |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L1\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_003.d

Injection Date: 01-Mar-2017 11:08:52

Instrument ID: A8\_N

Lims ID: IC L1 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 28

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

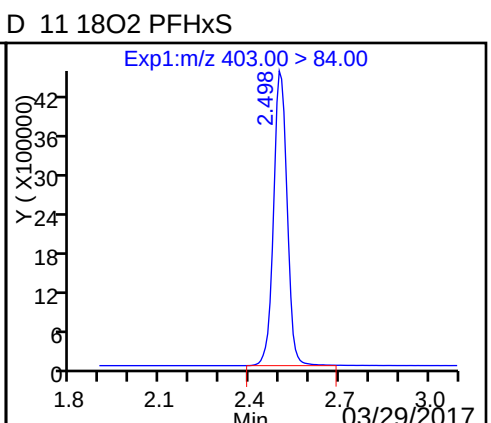
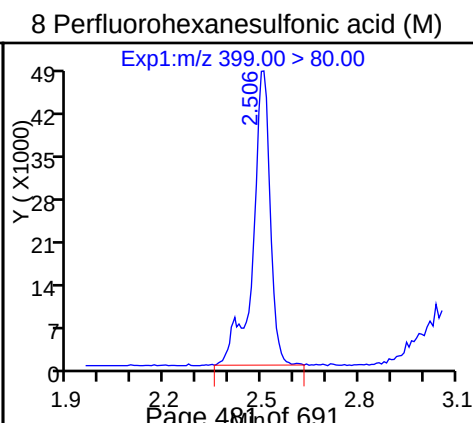
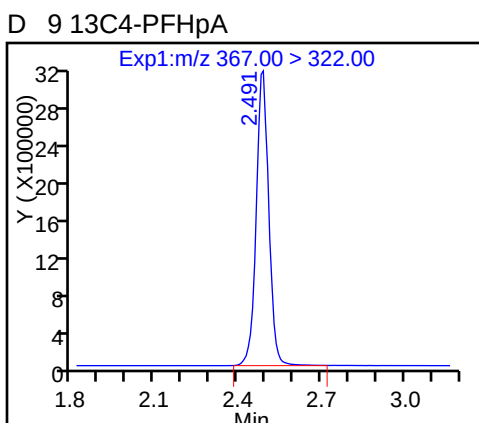
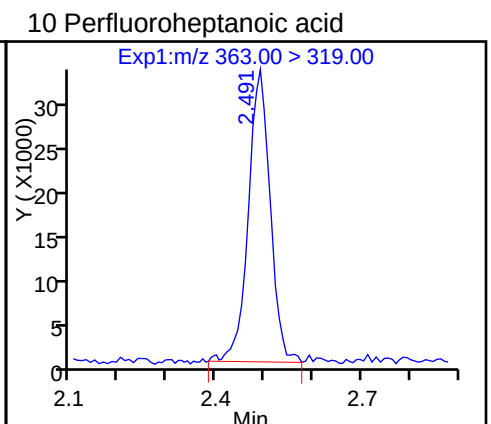
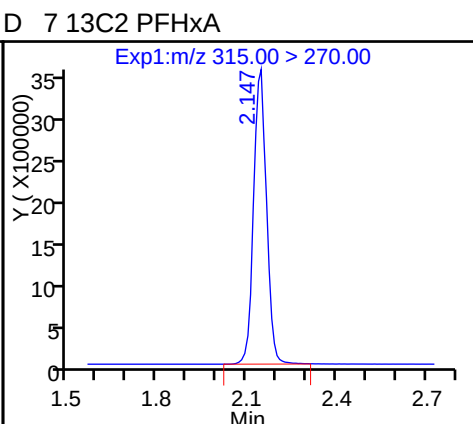
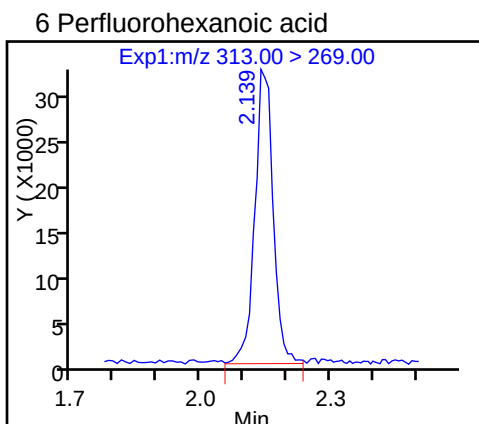
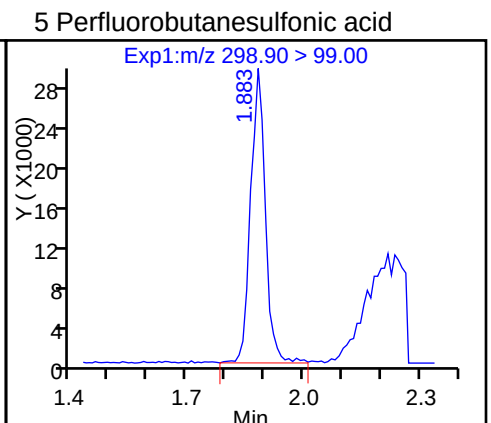
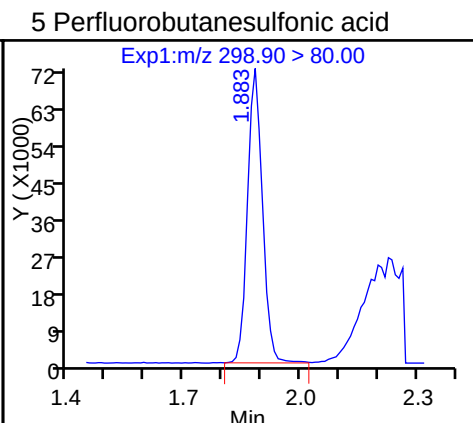
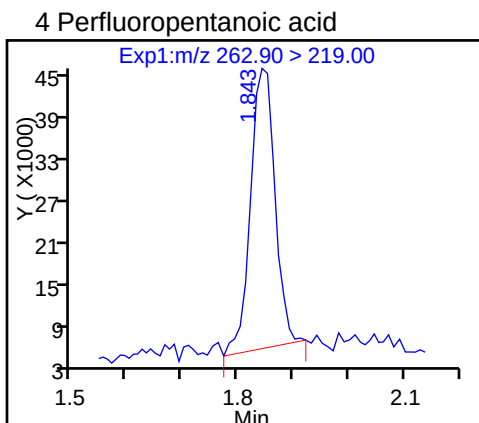
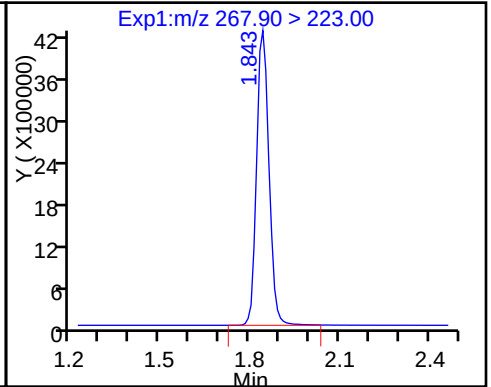
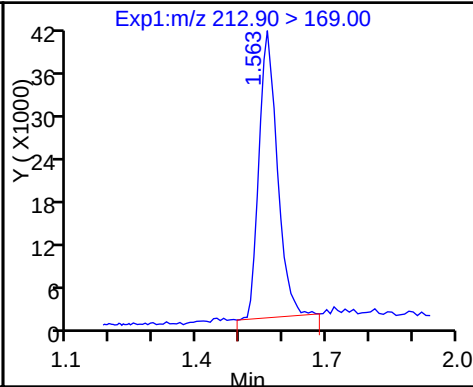
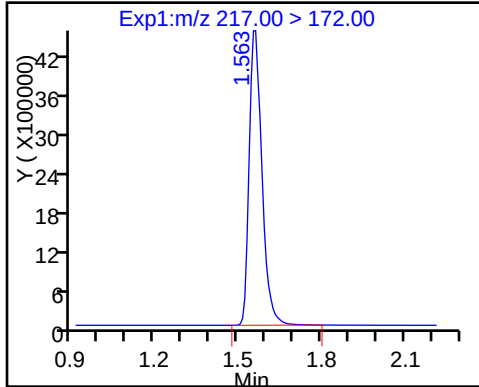
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

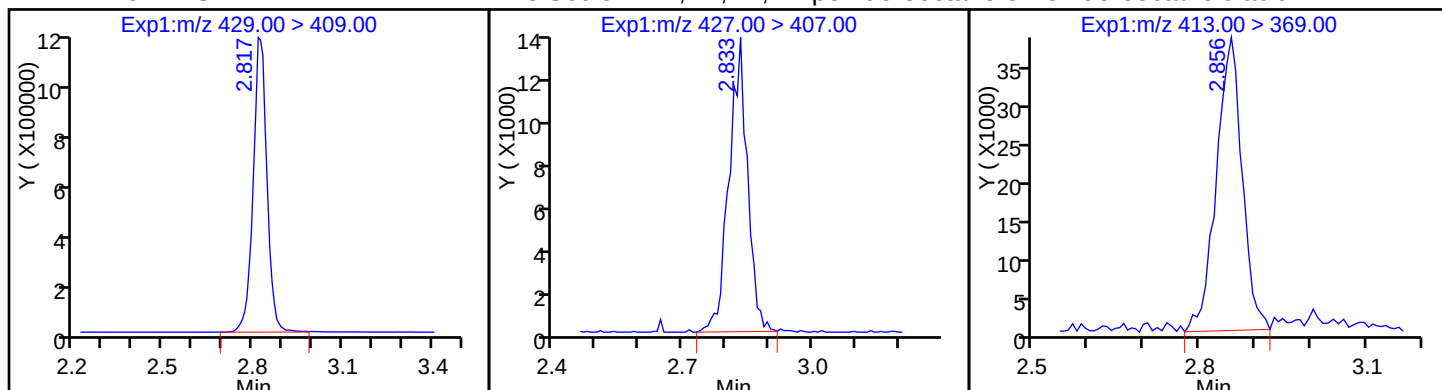
2 Perfluorobutyric acid

D 3 13C5-PFPeA



D 12 M2-6:2FTS

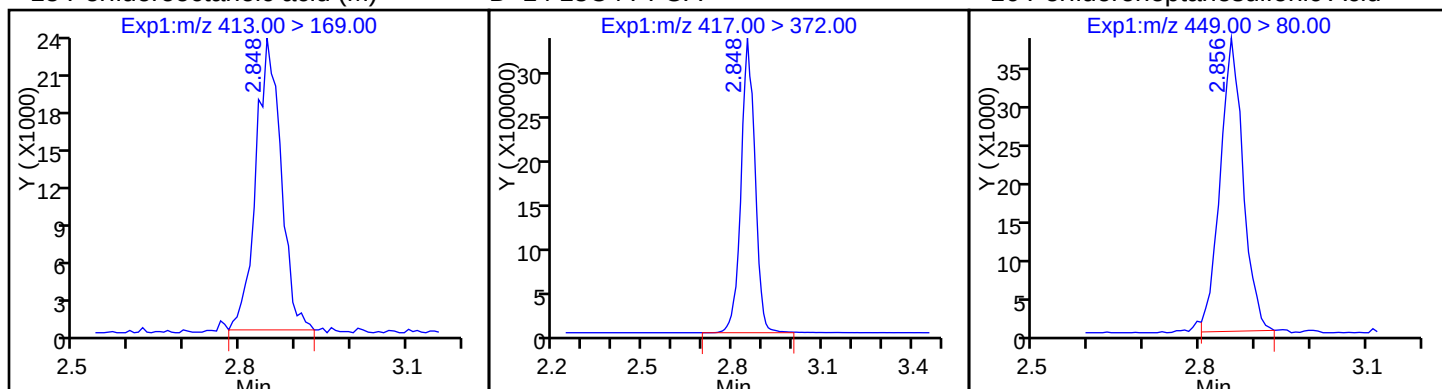
13 Sodium 1H,1H,2H,2H-perfluorooctane-1S Perfluorooctanoic acid



15 Perfluorooctanoic acid (M)

D 14 13C4 PFOA

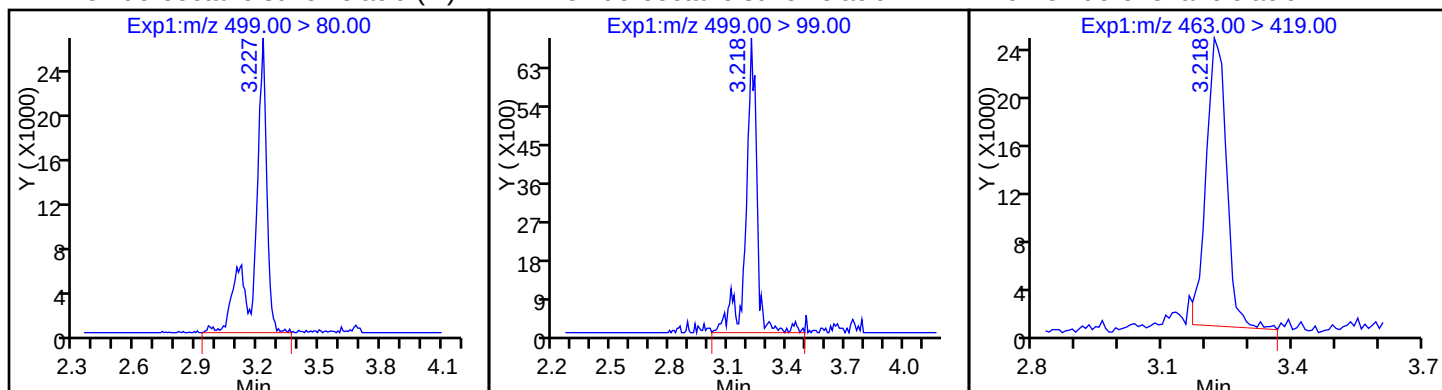
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid (M)

17 Perfluorooctane sulfonic acid

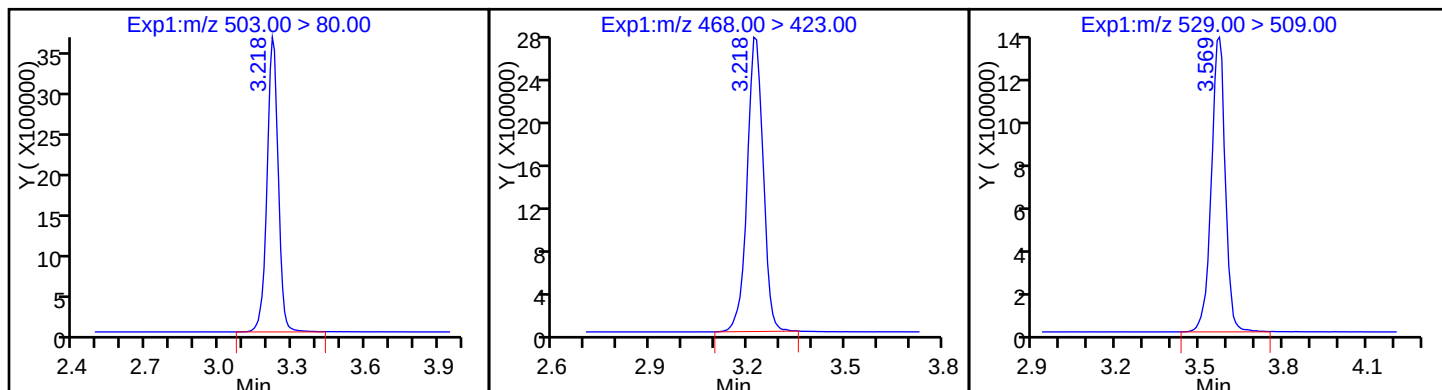
20 Perfluorononanoic acid



D 18 13C4 PFOS

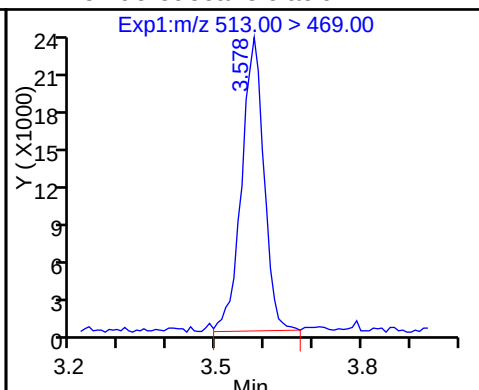
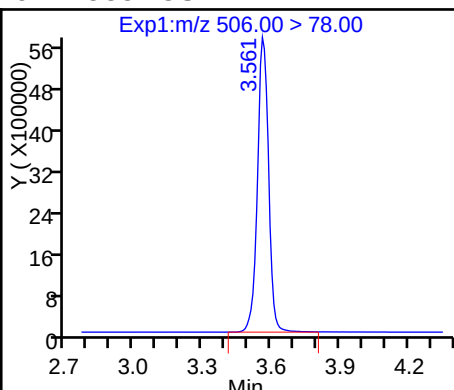
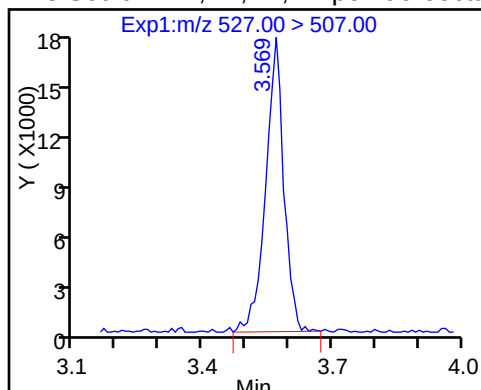
D 19 13C5 PFNA

D 26 M2-8:2FTS



## 25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

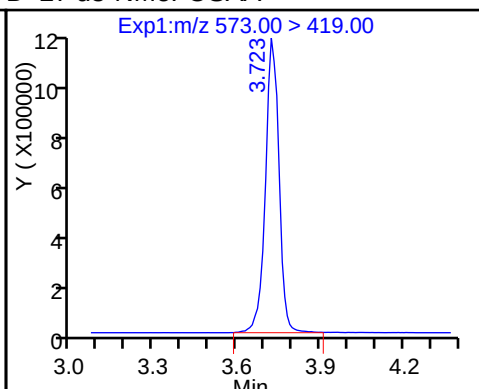
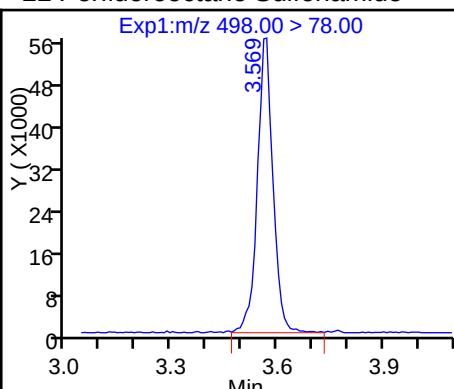
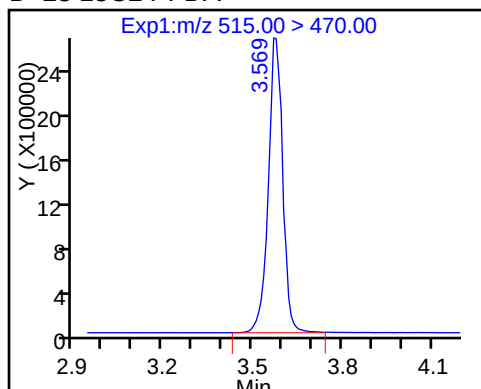
## 24 Perfluorodecanoic acid



## D 23 13C2 PFDA

## 22 Perfluorooctane Sulfonamide

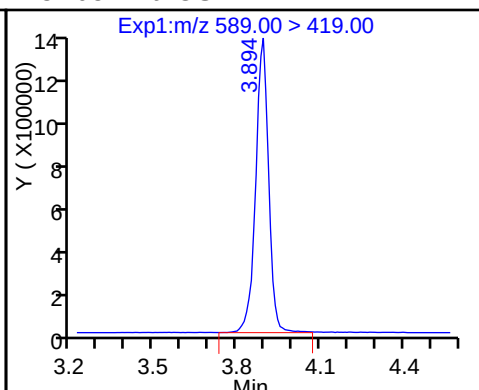
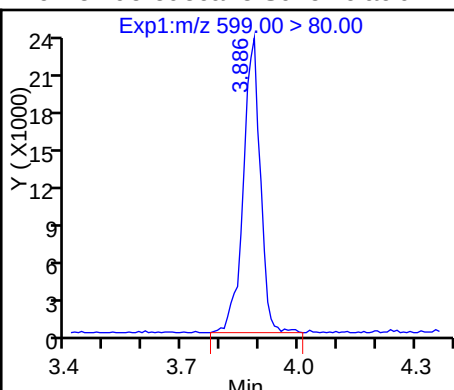
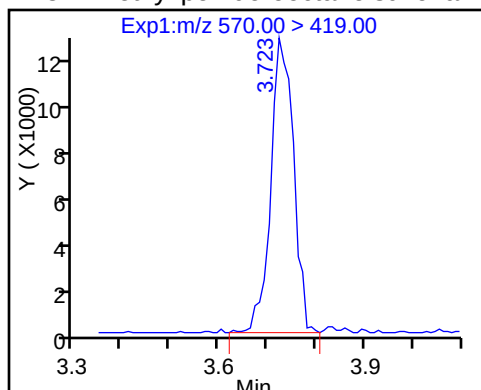
## D 27 d3-NMeFOSAA



## 28 N-methyl perfluorooctane sulfonami

## 29 Perfluorodecane Sulfonic acid

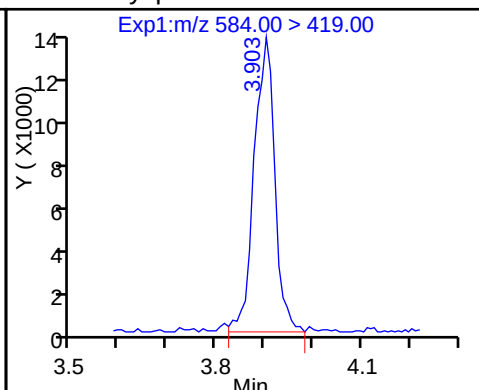
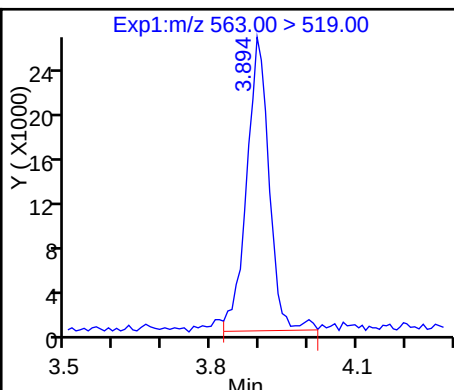
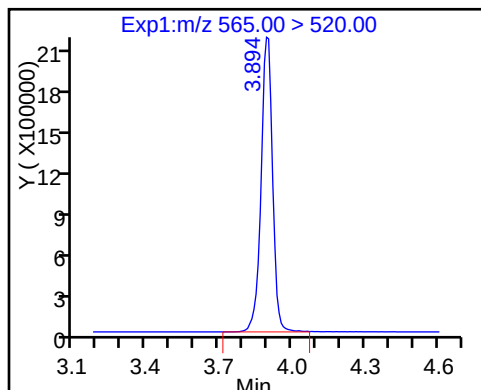
## D 32 d5-NEtFOSAA



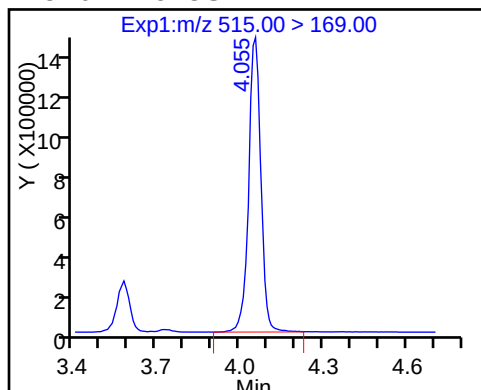
## D 30 13C2 PFUnA

## 31 Perfluoroundecanoic acid

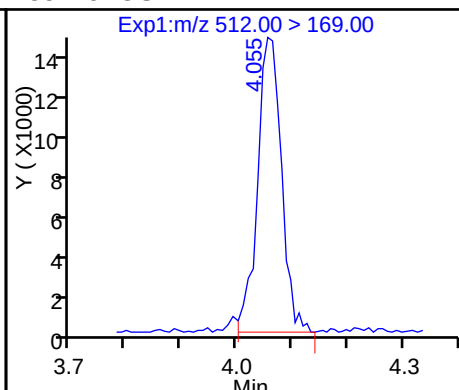
## 33 N-ethyl perfluorooctane sulfonamid



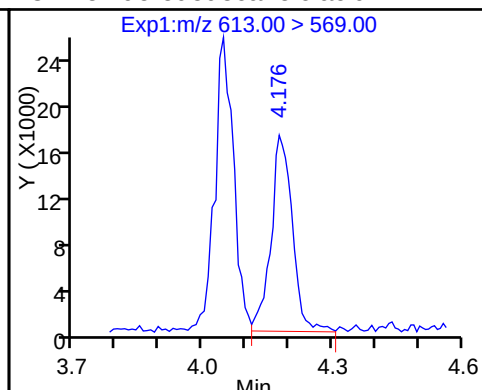
D 34 d-N-MeFOSA-M



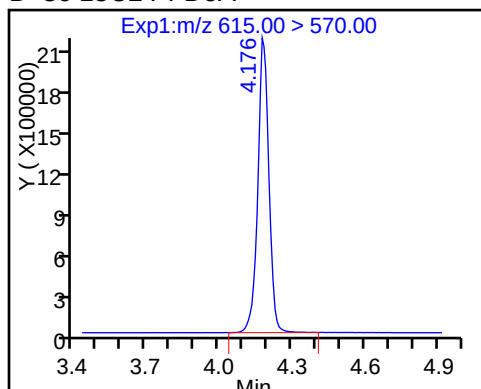
35 MeFOSA



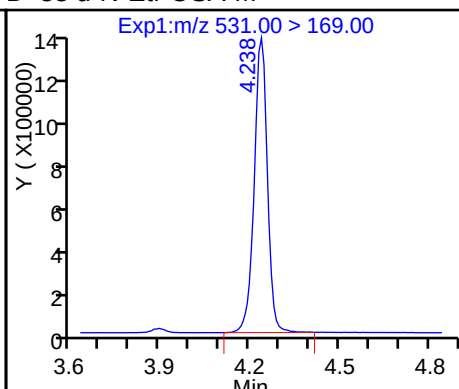
37 Perfluorododecanoic acid



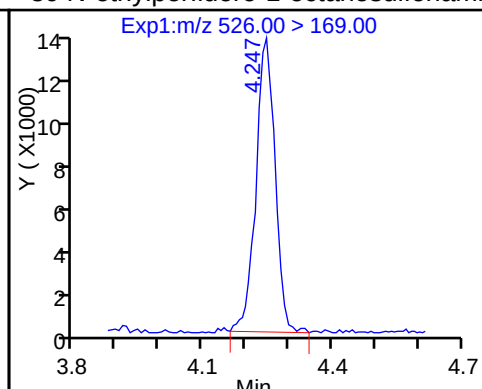
D 36 13C2 PFDaA



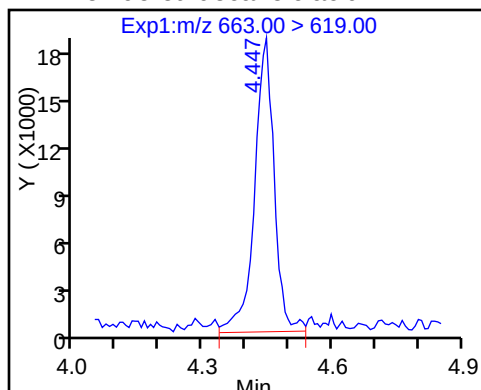
D 38 d-N-EtFOSA-M



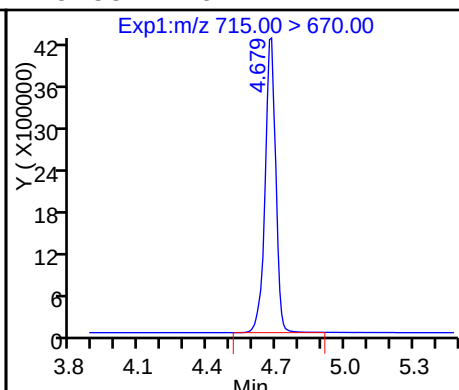
39 N-ethylperfluoro-1-octanesulfonami



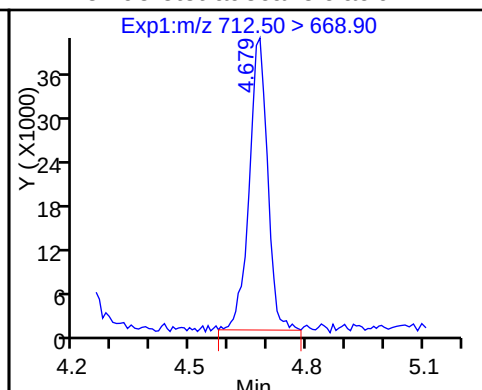
41 Perfluorotridecanoic acid



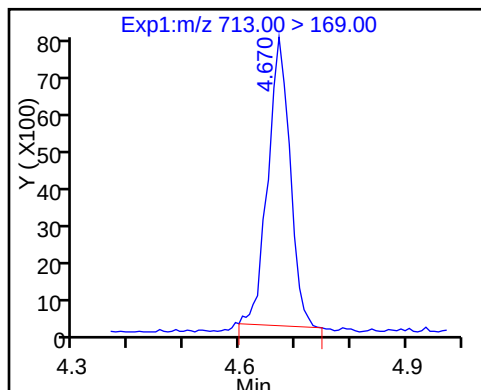
D 43 13C2-PFTeDA



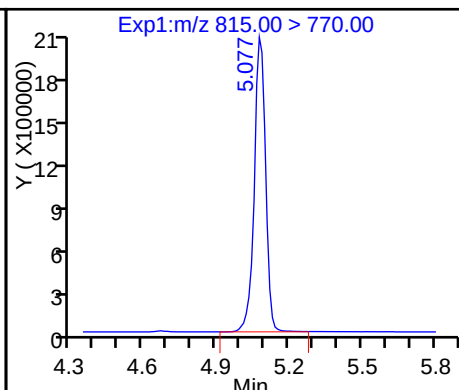
42 Perfluorotetradecanoic acid



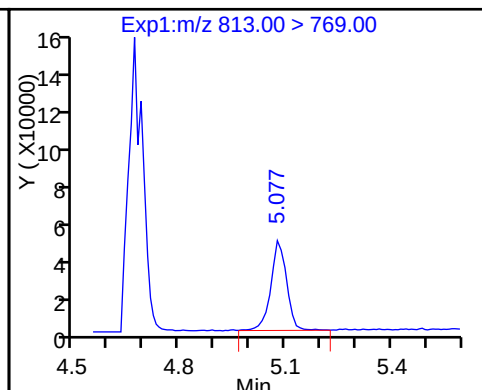
42 Perfluorotetradecanoic acid



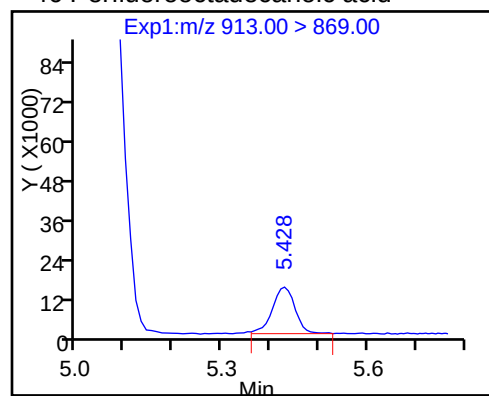
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_003.d

Injection Date: 01-Mar-2017 11:08:52

Instrument ID: A8\_N

Lims ID: IC L1 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#:

28

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

Column:

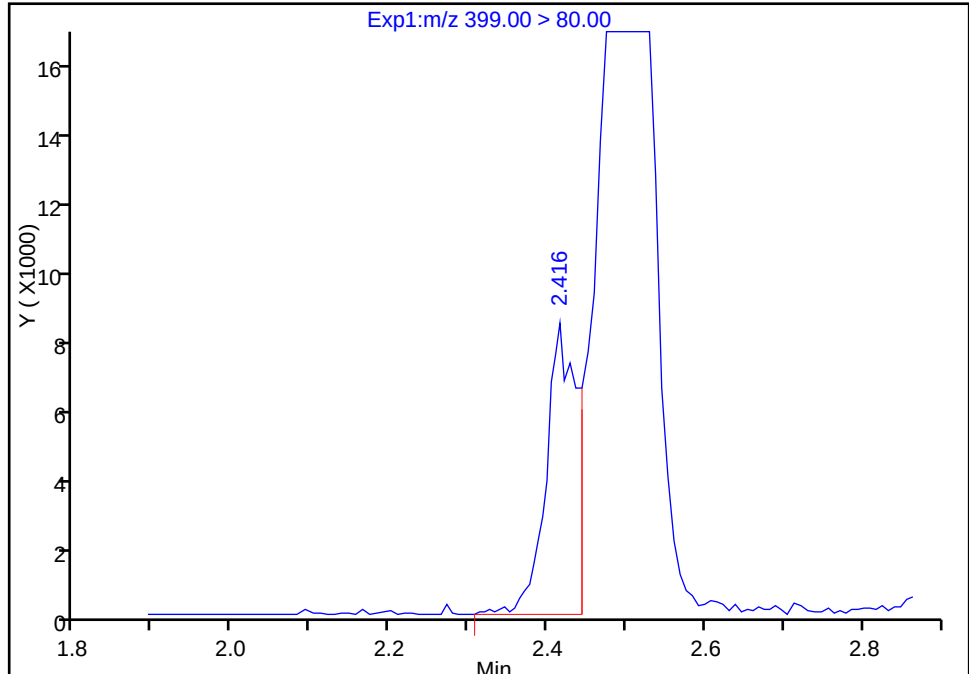
Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

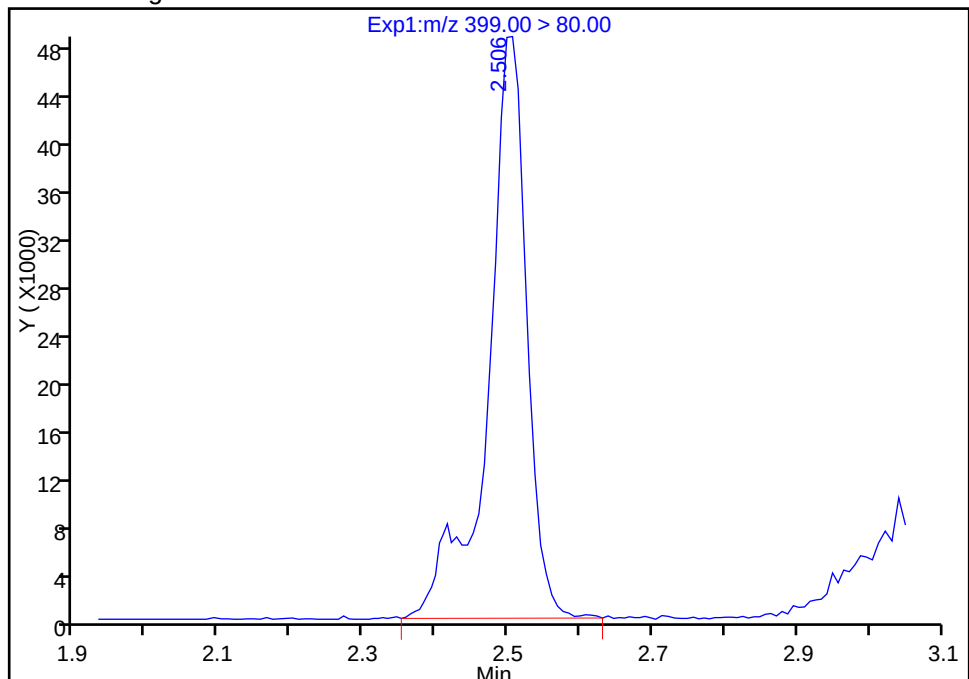
RT: 2.42  
Area: 21187  
Amount: 0.082505  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.51  
Area: 182218  
Amount: 0.583043  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:05

Audit Action: Manually Integrated

Audit Reason: Isomers



## TestAmerica Sacramento

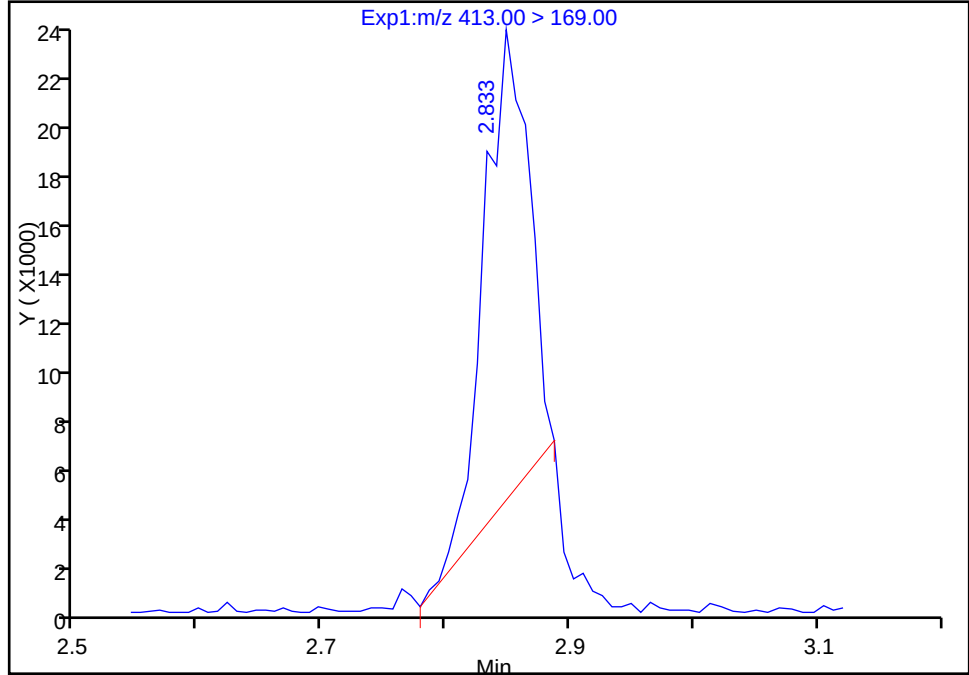
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_003.d  
Injection Date: 01-Mar-2017 11:08:52 Instrument ID: A8\_N  
Lims ID: IC L1 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 28 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

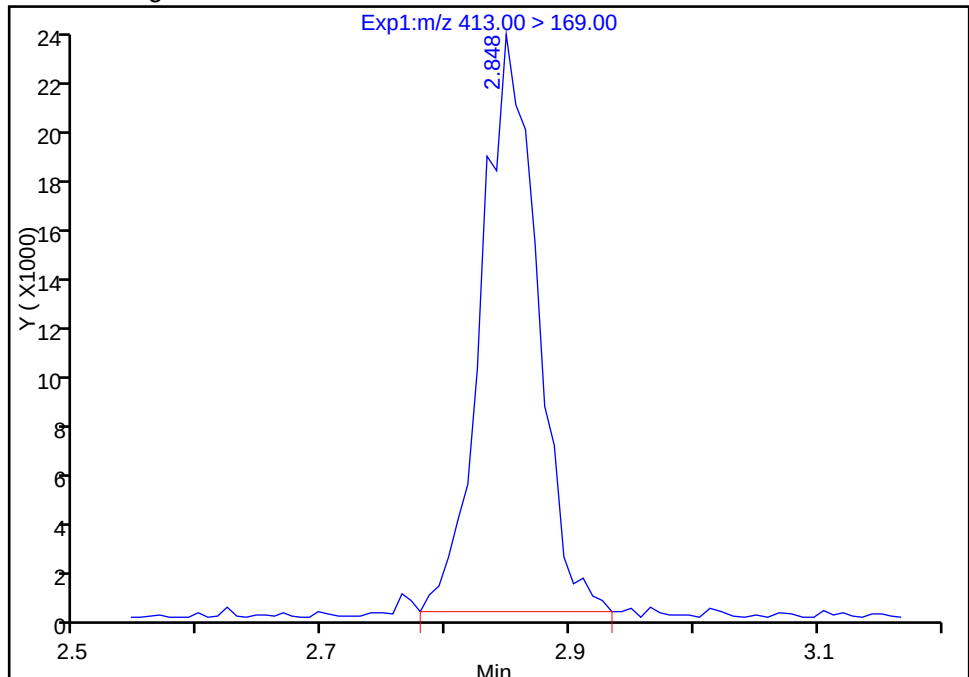
RT: 2.83  
Area: 46440  
Amount: 0.535520  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.85  
Area: 71985  
Amount: 0.538943  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:05

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_003.d

Injection Date: 01-Mar-2017 11:08:52

Instrument ID: A8\_N

Lims ID: IC L1 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 28 Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

Column:

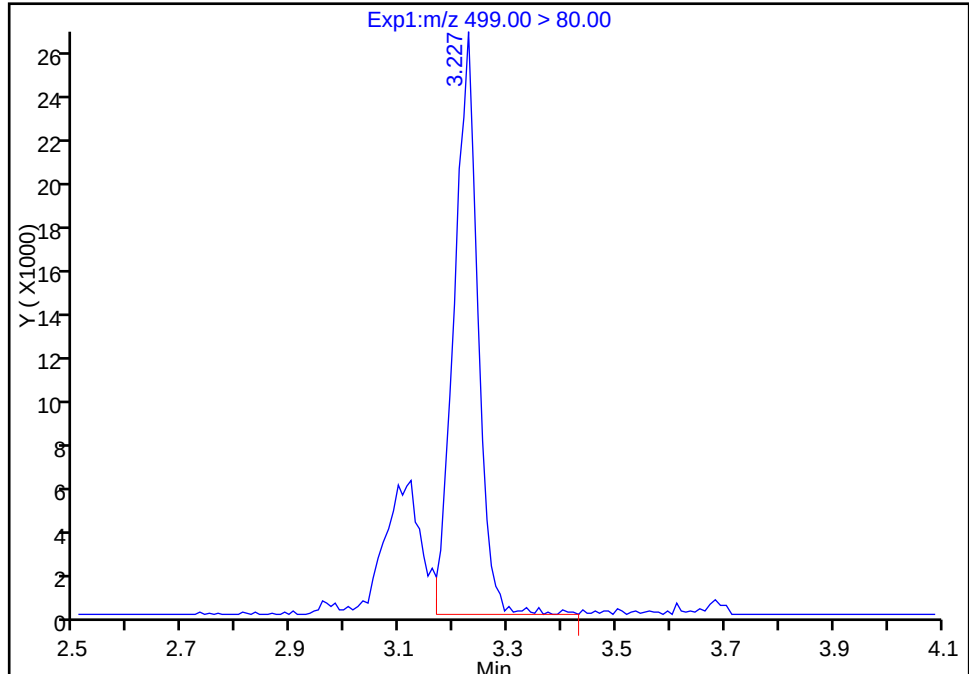
Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

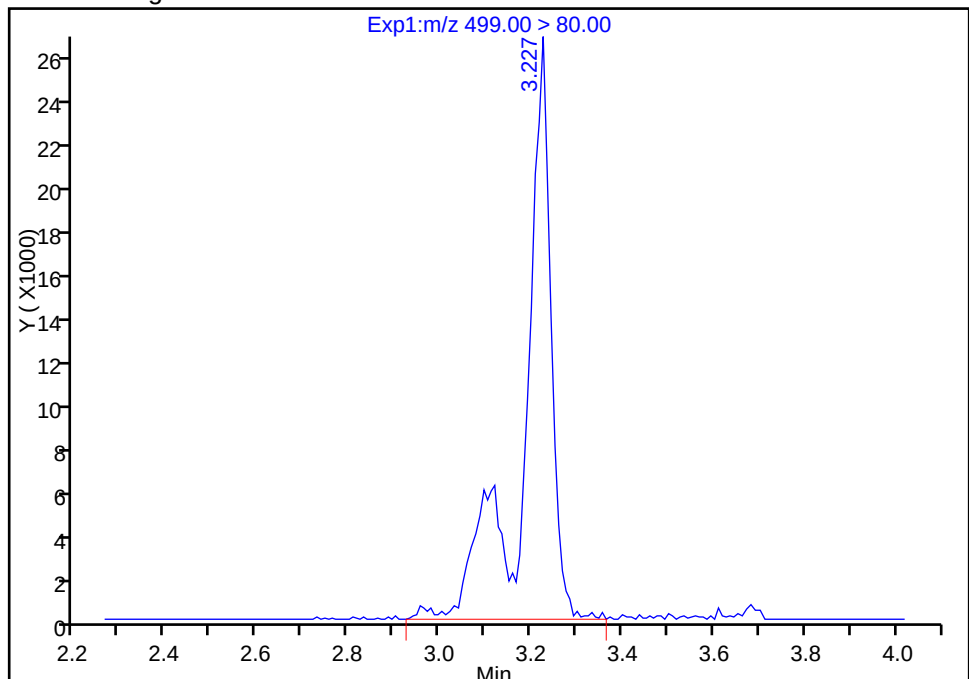
RT: 3.23  
Area: 79141  
Amount: 0.356104  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.23  
Area: 108156  
Amount: 0.442463  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:05

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_004.d  
 Lims ID: IC L2 Full  
 Client ID:  
 Sample Type: IC Calib Level: 2  
 Inject. Date: 01-Mar-2017 11:16:22 ALS Bottle#: 29 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L2-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:08 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 12:00:43

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.554 | 1.553  | 0.001  |        | 14105138 | 48.3         |                 | 96.5 | 750485 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                       | 1.562 | 1.558  | 0.004  | 1.000  | 236552   | 0.9897       |                 | 99.0 | 2199   |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.842 | 1.832  | 0.010  |        | 11526786 | 49.6         |                 | 99.3 | 662915 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.842 | 1.835  | 0.007  | 1.000  | 233761   | 1.04         |                 | 104  | 2126   |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.872 | 1.872  | 0.0    | 1.000  | 364249   | 0.8869       |                 | 100  |        |       |
| 298.90 > 99.00                        | 1.881 | 1.872  | 0.009  | 1.005  | 152095   |              | 2.39(0.00-0.00) | 100  |        |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                       | 2.145 | 2.133  | 0.012  | 1.000  | 183108   | 1.01         |                 | 101  | 6537   |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.136 | 2.134  | 0.002  |        | 10169363 | 48.2         |                 | 96.4 | 286031 |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                       | 2.484 | 2.474  | 0.010  | 1.000  | 185040   | 0.9858       |                 | 98.6 | 1690   |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.484 | 2.475  | 0.009  |        | 9702633  | 50.3         |                 | 101  | 436206 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 399.00 > 80.00                        | 2.500 | 2.485  | 0.015  | 1.000  | 294799   | 1.00         |                 | 110  |        |       |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.500 | 2.489  | 0.011  |        | 13561303 | 46.6         |                 | 98.6 | 442791 |       |
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 429.00 > 409.00                       | 2.810 | 2.805  | 0.005  |        | 3521088  | 45.6         |                 | 96.0 |        |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.818 | 2.807  | 0.011  | 1.000  | 71833    | 0.9579       |                 | 101  |        |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 14 13C4 PFOA                        |       |           |           |           |          |                 |                 |      |        |       |
| 417.00 > 372.00                       | 2.849 | 2.835     | 0.014     |           | 10562914 | 51.5            |                 | 103  | 412762 |       |
| 15 Perfluorooctanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 413.00 > 369.00                       | 2.841 | 2.835     | 0.006     | 1.000     | 226350   | 1.05            |                 | 105  | 2696   |       |
| 413.00 > 169.00                       | 2.849 | 2.835     | 0.014     | 1.003     | 125043   |                 | 1.81(0.90-1.10) | 105  | 5452   |       |
| 16 Perfluoroheptanesulfonic Acid      |       |           |           |           |          |                 |                 |      |        |       |
| 449.00 > 80.00                        | 2.857 | 2.842     | 0.015     | 1.000     | 228885   | 0.9637          |                 | 101  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 499.00 > 80.00                        | 3.105 | 3.145     | -0.040    | 1.000     | 207277   | 0.9149          |                 | 98.6 | 3256   |       |
| 499.00 > 99.00                        | 3.105 | 3.145     | -0.040    | 1.000     | 49944    |                 | 4.15(0.90-1.10) | 98.6 | 444    |       |
| 20 Perfluorononanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 463.00 > 419.00                       | 3.209 | 3.202     | 0.007     | 1.000     | 152789   | 0.9337          |                 | 93.4 | 2607   |       |
| D 18 13C4 PFOS                        |       |           |           |           |          |                 |                 |      |        |       |
| 503.00 > 80.00                        | 3.218 | 3.204     | 0.014     |           | 11011810 | 45.6            |                 | 95.3 | 389996 |       |
| D 19 13C5 PFNA                        |       |           |           |           |          |                 |                 |      |        |       |
| 468.00 > 423.00                       | 3.218 | 3.208     | 0.010     |           | 9051156  | 50.9            |                 | 102  | 347551 |       |
| D 26 M2-8:2FTS                        |       |           |           |           |          |                 |                 |      |        |       |
| 529.00 > 509.00                       | 3.553 | 3.545     | 0.008     |           | 4549526  | 49.1            |                 | 103  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |           |           |           |          |                 |                 |      |        |       |
| 527.00 > 507.00                       | 3.561 | 3.546     | 0.015     | 1.002     | 89032    | 0.9299          |                 | 97.1 |        |       |
| D 21 13C8 FOSA                        |       |           |           |           |          |                 |                 |      |        |       |
| 506.00 > 78.00                        | 3.561 | 3.559     | 0.002     |           | 18089578 | 49.3            |                 | 98.6 | 237400 |       |
| D 23 13C2 PFDA                        |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 470.00                       | 3.569 | 3.560     | 0.009     |           | 8593124  | 51.5            |                 | 103  | 177955 |       |
| 24 Perfluorodecanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 513.00 > 469.00                       | 3.569 | 3.560     | 0.009     | 1.000     | 152408   | 0.9792          |                 | 97.9 | 5902   |       |
| 22 Perfluorooctane Sulfonamide        |       |           |           |           |          |                 |                 |      |        |       |
| 498.00 > 78.00                        | 3.561 | 3.561     | 0.0       | 1.000     | 339522   | 1.04            |                 | 104  | 20364  |       |
| D 27 d3-NMeFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 573.00 > 419.00                       | 3.723 | 3.710     | 0.013     |           | 3998931  | 46.9            |                 | 93.9 |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 570.00 > 419.00                       | 3.723 | 3.713     | 0.010     | 1.000     | 78506    | 1.01            |                 | 101  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 599.00 > 80.00                        | 3.876 | 3.866     | 0.010     | 1.000     | 125403   | 0.9138          |                 | 94.8 |        |       |
| D 32 d5-NEtFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 589.00 > 419.00                       | 3.885 | 3.875     | 0.010     |           | 4097675  | 50.4            |                 | 101  |        |       |
| D 30 13C2 PFUnA                       |       |           |           |           |          |                 |                 |      |        |       |
| 565.00 > 520.00                       | 3.885 | 3.876     | 0.009     |           | 6740958  | 51.5            |                 | 103  | 252062 |       |
| 31 Perfluoroundecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 563.00 > 519.00                       | 3.885 | 3.878     | 0.007     | 1.000     | 137967   | 1.01            |                 | 101  | 3114   |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |           |           |           |          |                 |                 |      |        |       |
| 584.00 > 419.00                       | 3.885 | 3.883     | 0.002     | 1.000     | 77078    | 1.03            |                 | 103  |        |       |
| D 34 d-N-MeFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 169.00                       | 4.055 | 4.050     | 0.005     |           | 4054503  | 46.1            |                 | 92.2 |        |       |
| 35 MeFOSA                             |       |           |           |           |          |                 |                 |      |        |       |
| 512.00 > 169.00                       | 4.064 | 4.057     | 0.007     | 1.000     | 75129    | 0.99            |                 | 99.0 |        |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 613.00 > 569.00                       | 4.175 | 4.162     | 0.013     | 1.000     | 113238   | 1.03            |                 | 103  | 1051   |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.175 | 4.164     | 0.011     |           | 6032319  | 48.7            |                 | 97.3 | 172379 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.237 | 4.235     | 0.002     |           | 3920378  | 46.0            |                 | 92.0 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.246 | 4.242     | 0.004     | 1.000     | 79073    | 1.03            |                 | 103  |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.430 | 4.424     | 0.006     | 1.000     | 103052   | 0.9780          |                 | 97.8 | 2577   |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.667 | 4.655     | 0.012     |           | 12309406 | 47.5            |                 | 95.0 | 383508 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.667 | 4.657     | 0.010     | 1.000     | 238596   | 1.01            |                 | 101  | 1077   |       |
| 713.00 > 169.00                       | 4.667 | 4.657     | 0.010     | 1.000     | 36141    |                 | 6.60(0.00-0.00) | 101  | 11217  |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.070 | 5.057     | 0.013     |           | 5742128  | 45.9            |                 | 91.8 | 84169  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.070 | 5.059     | 0.011     | 1.000     | 171523   | 1.16            |                 | 116  | 217    |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.414 | 5.399     | 0.015     | 1.000     | 81601    | 0.9426          |                 | 94.3 | 179    |       |

**Reagents:**

LCPFC\_FULL-L2\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_004.d

Injection Date: 01-Mar-2017 11:16:22

Instrument ID: A8\_N

Lims ID: IC L2 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 29

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

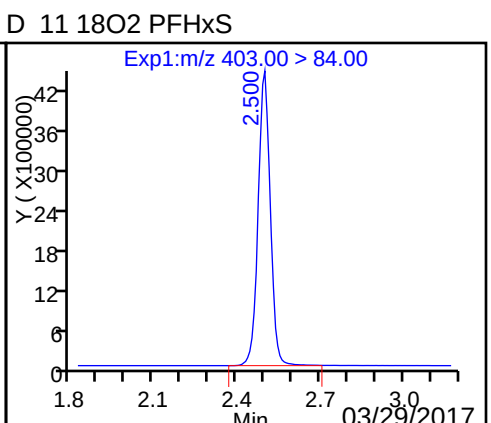
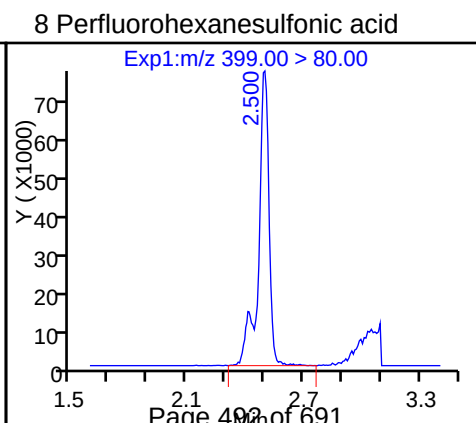
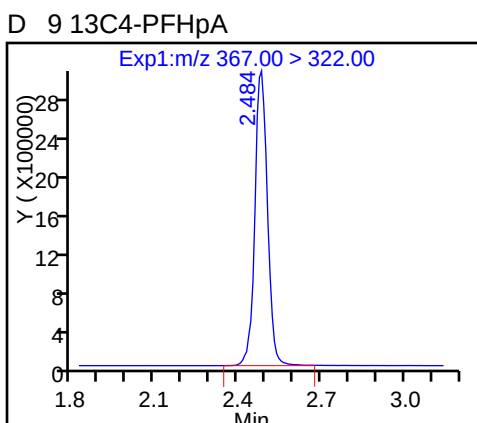
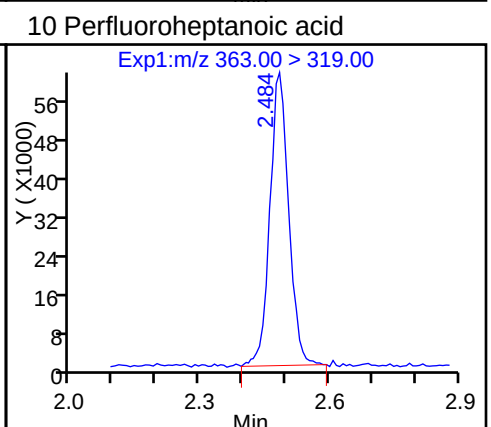
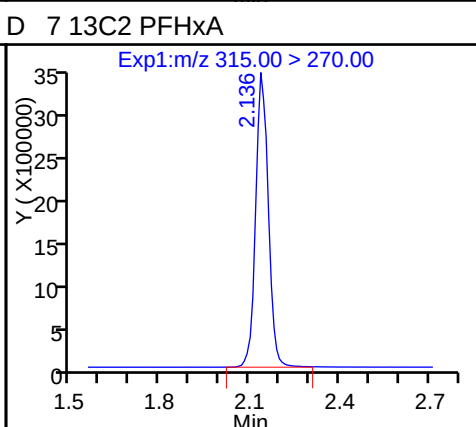
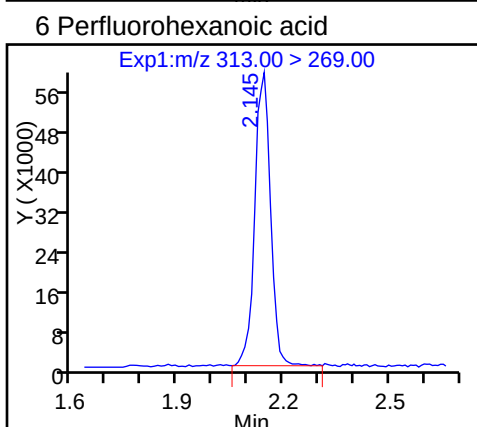
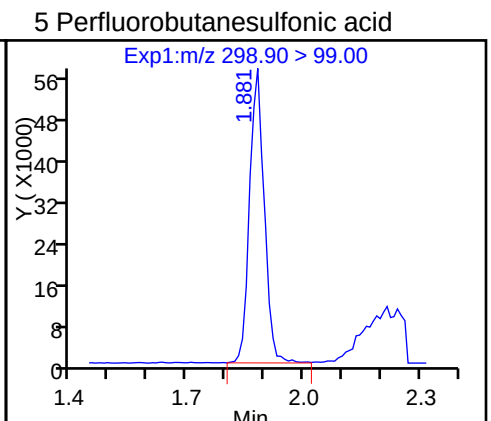
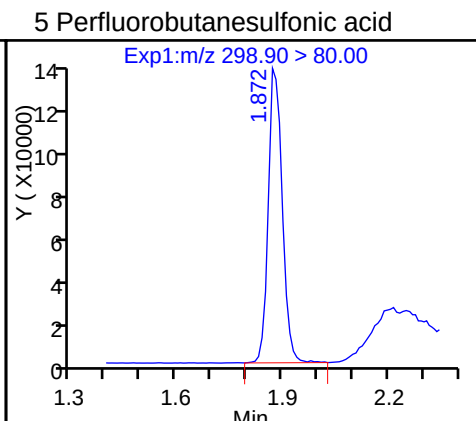
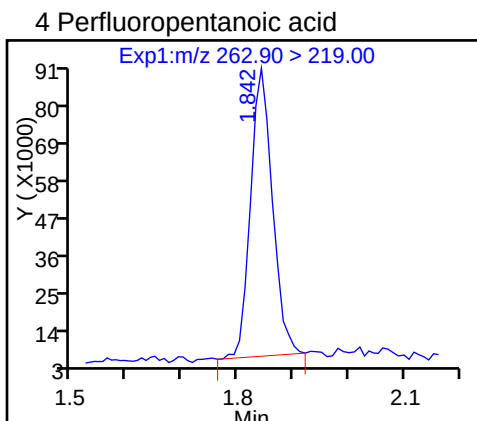
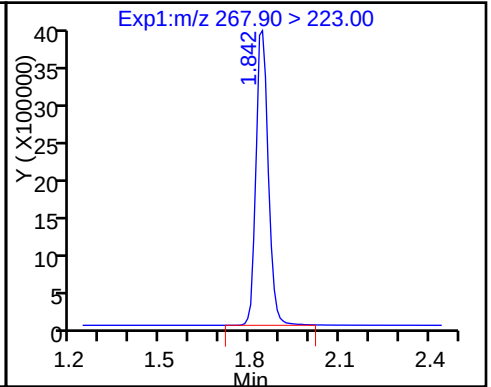
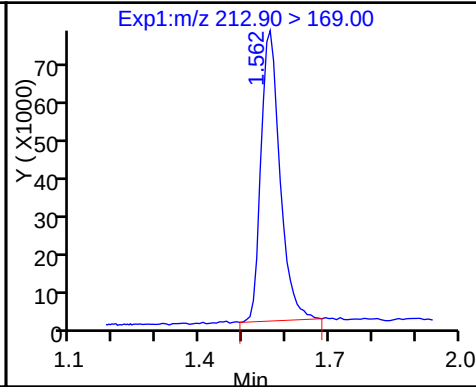
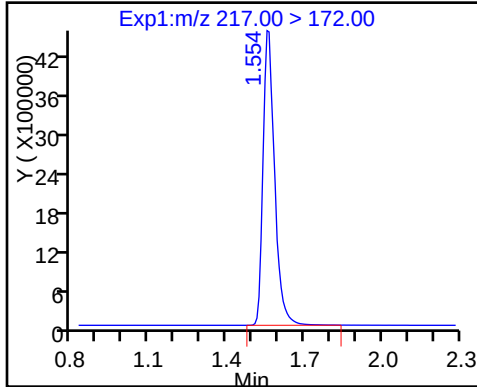
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

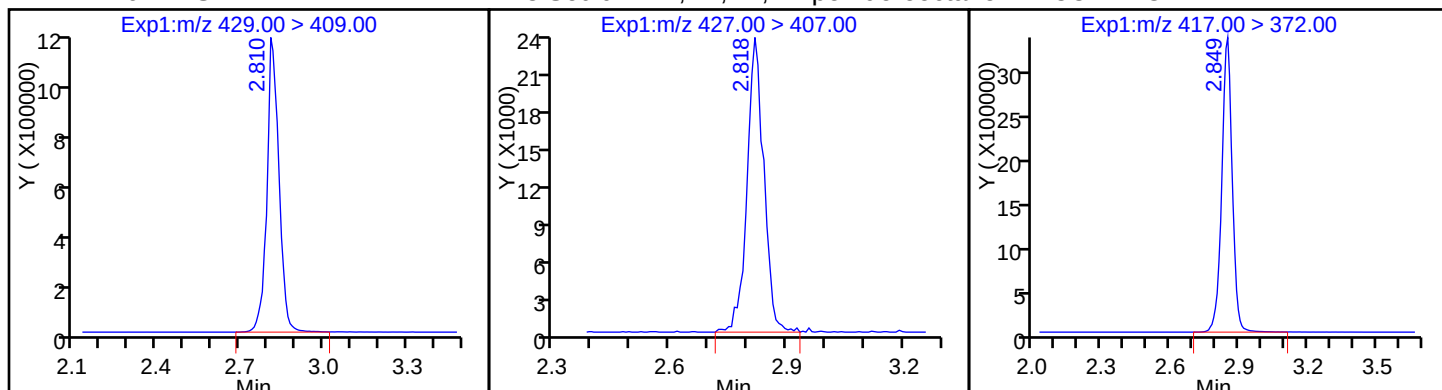
D 3 13C5-PFPeA



D 12 M2-6:2FTS

13 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

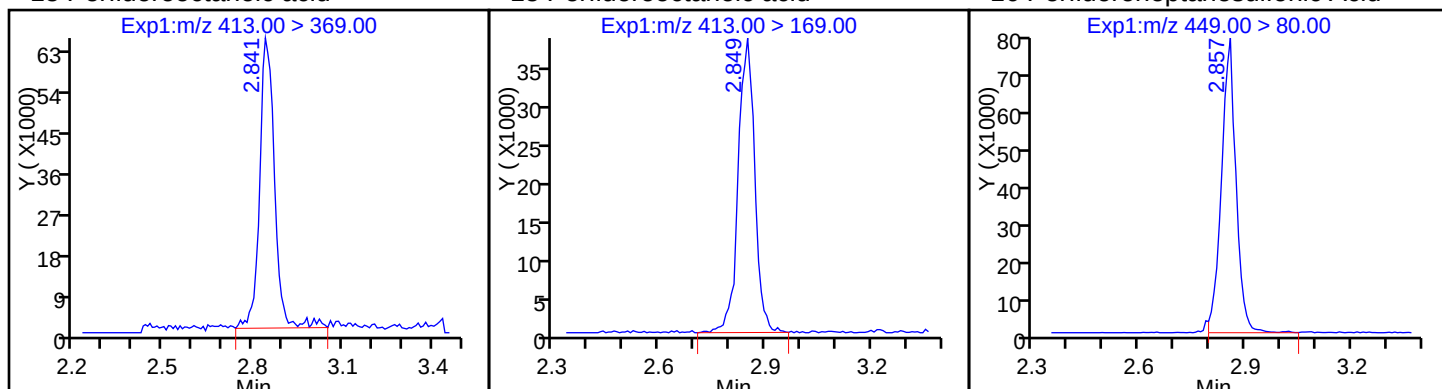
D 14 13C4 PFOA



15 Perfluorooctanoic acid

15 Perfluorooctanoic acid

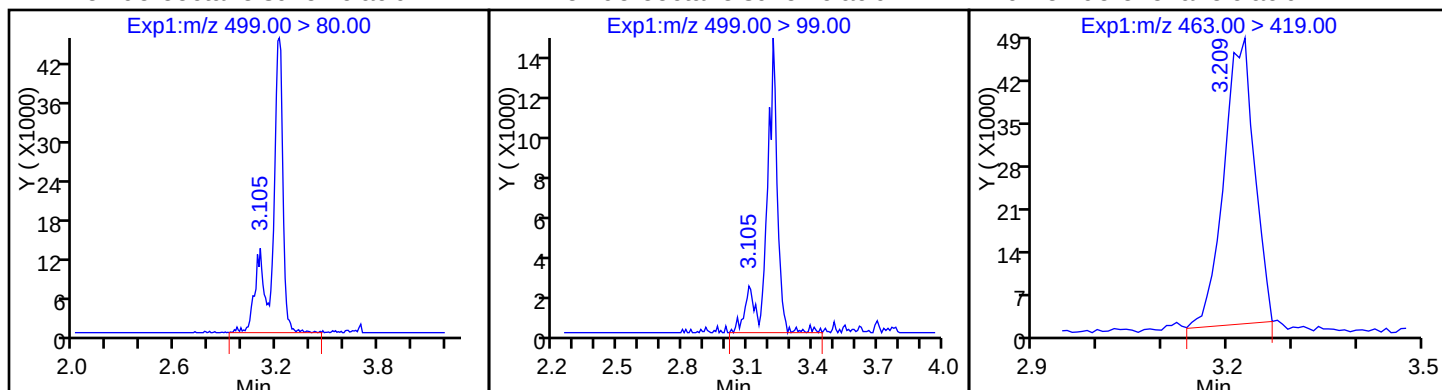
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

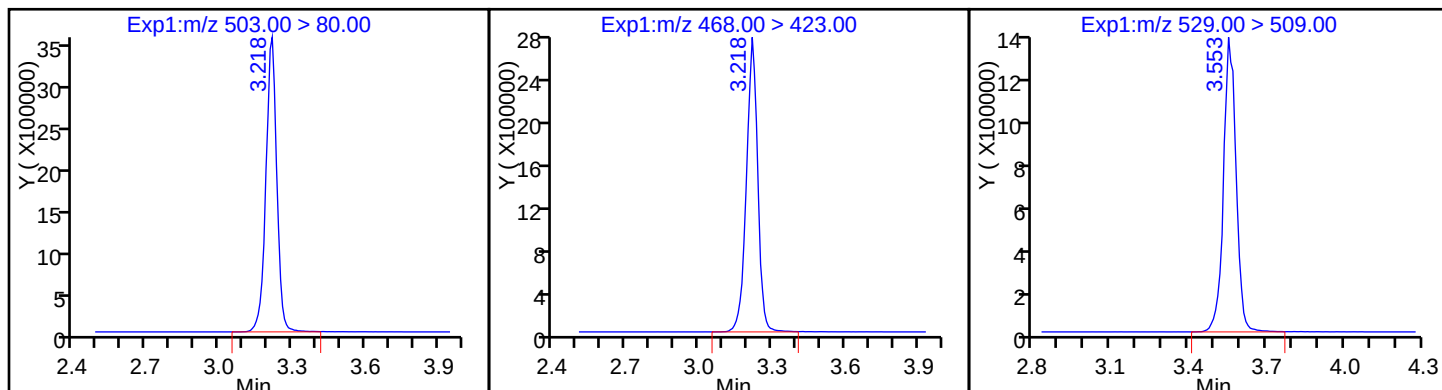
20 Perfluorononanoic acid



D 18 13C4 PFOS

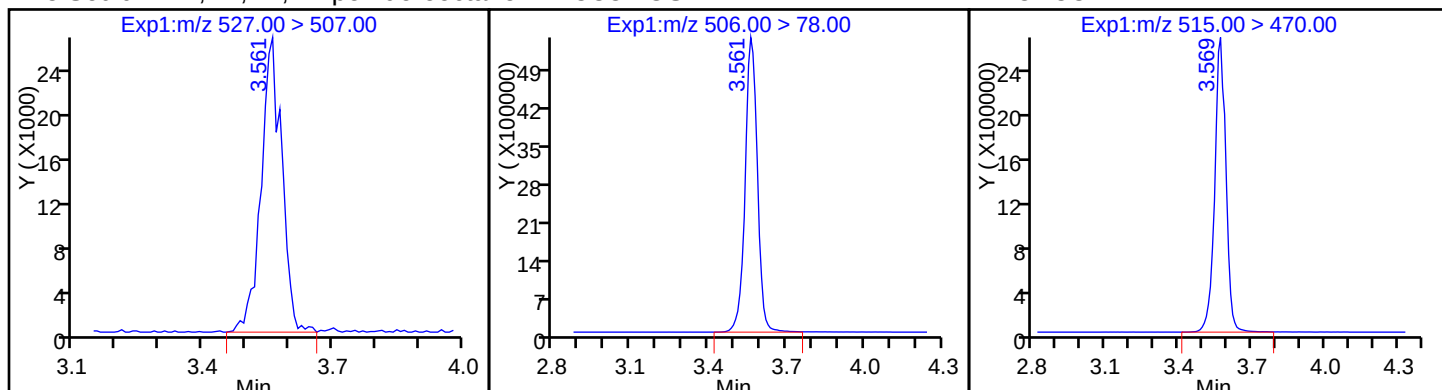
D 19 13C5 PFNA

D 26 M2-8:2FTS



25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

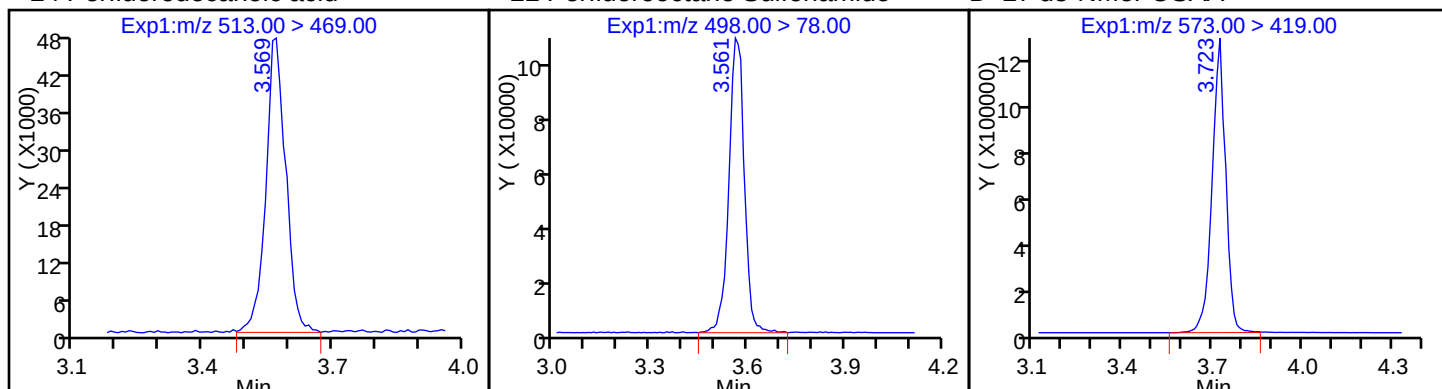
D 23 13C2 PFDA



24 Perfluorodecanoic acid

22 Perfluorooctane Sulfonamide

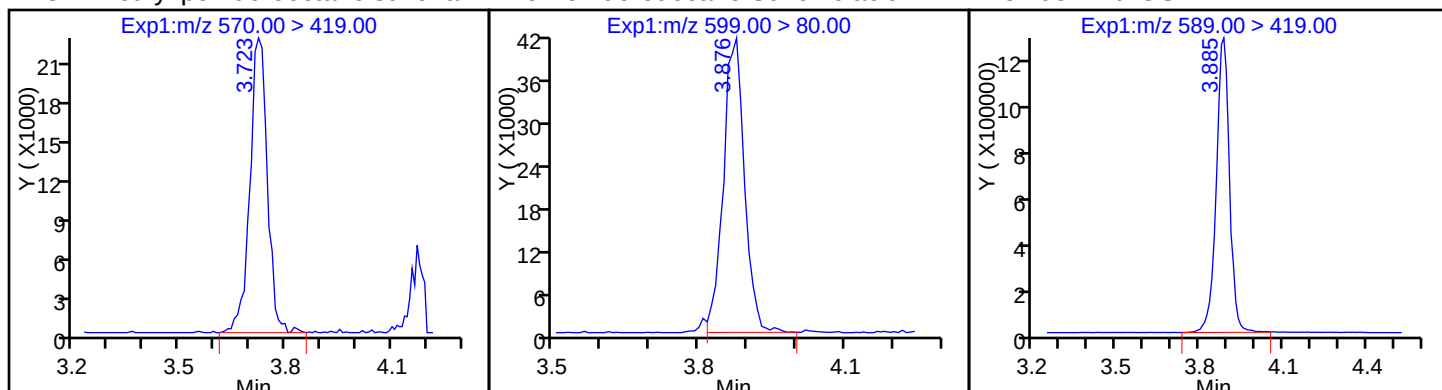
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

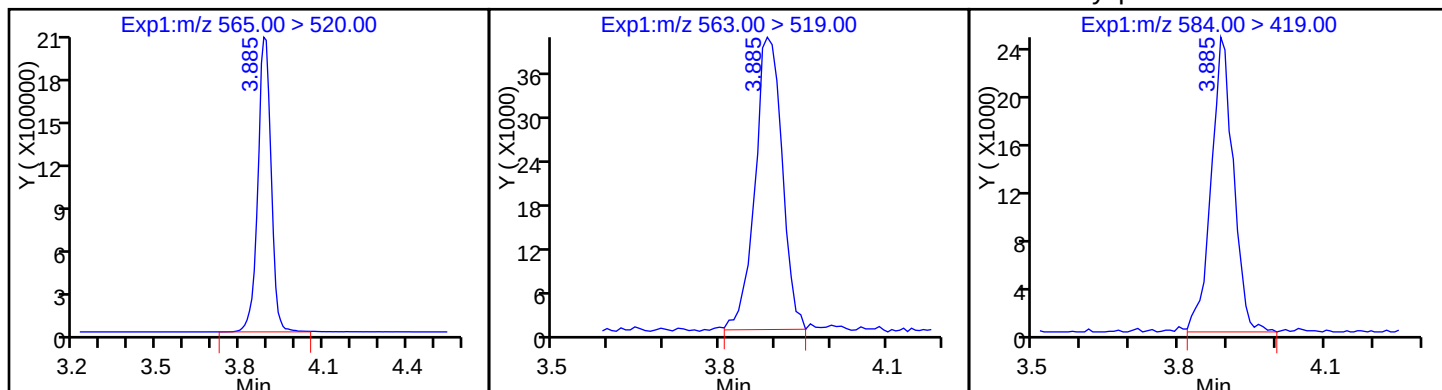
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

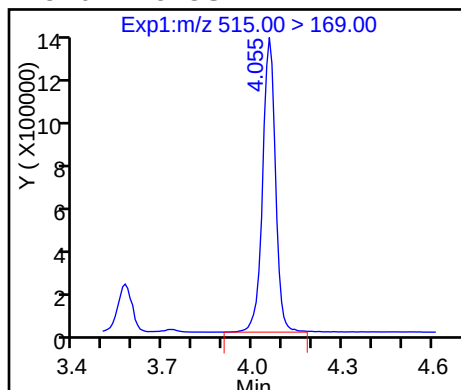
31 Perfluoroundecanoic acid

33 N-ethyl perfluorooctane sulfonamid

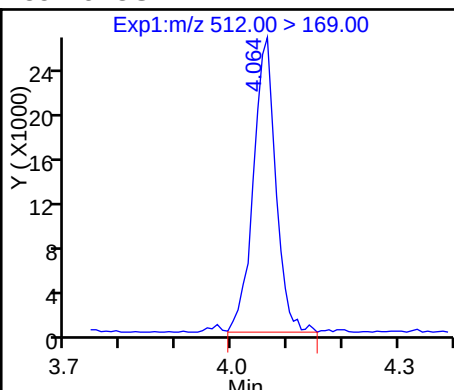




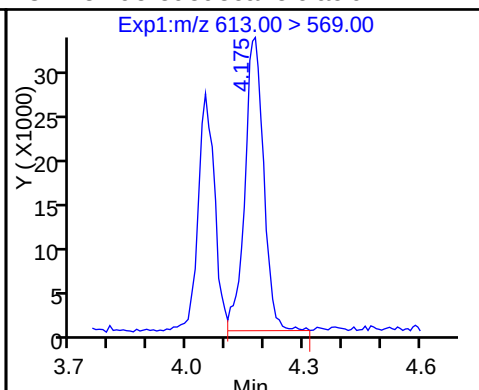
D 34 d-N-MeFOSA-M



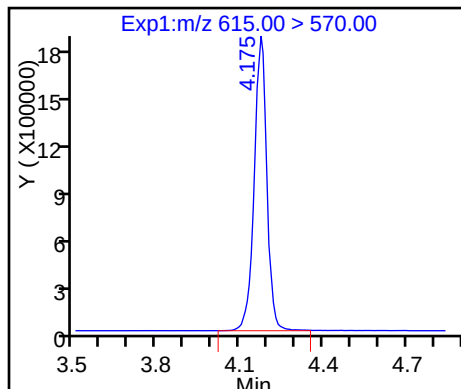
35 MeFOSA



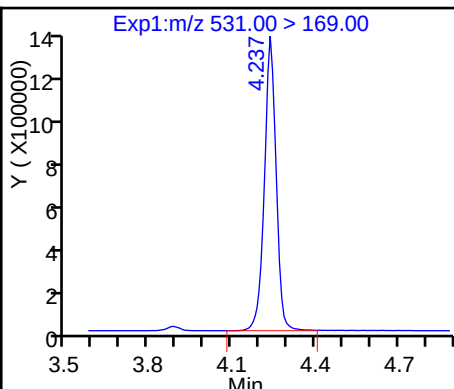
37 Perfluorododecanoic acid



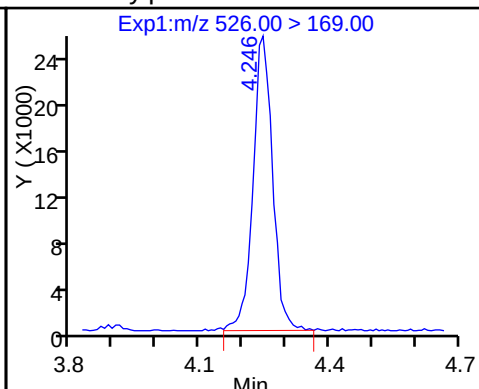
D 36 13C2 PFDaA



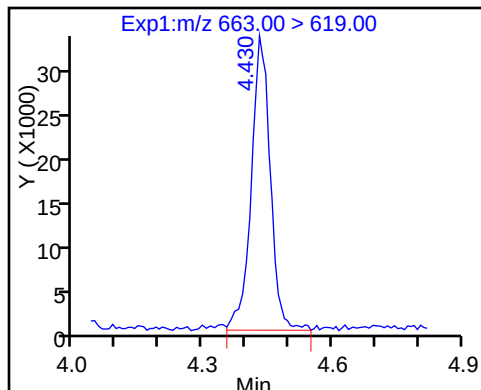
D 38 d-N-EtFOSA-M



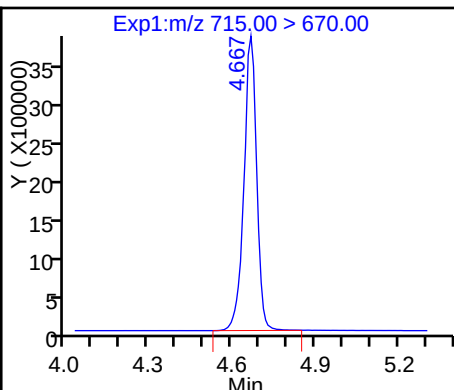
39 N-ethylperfluoro-1-octanesulfonami



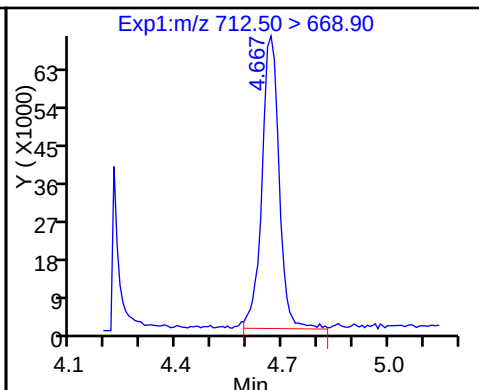
41 Perfluorotridecanoic acid



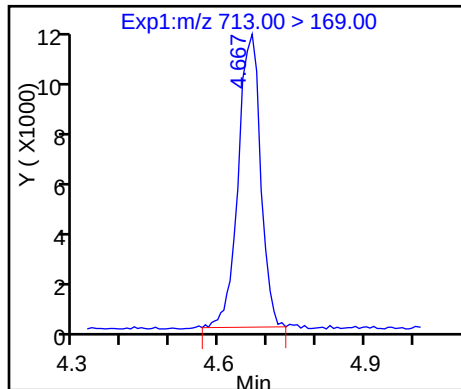
D 43 13C2-PFTeDA



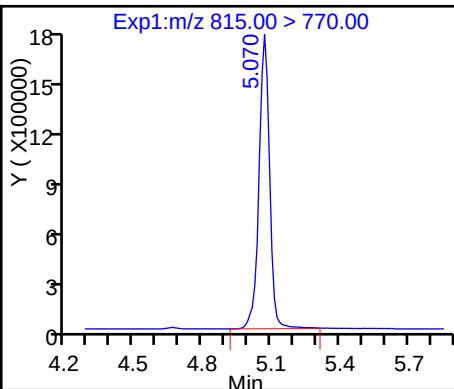
42 Perfluorotetradecanoic acid



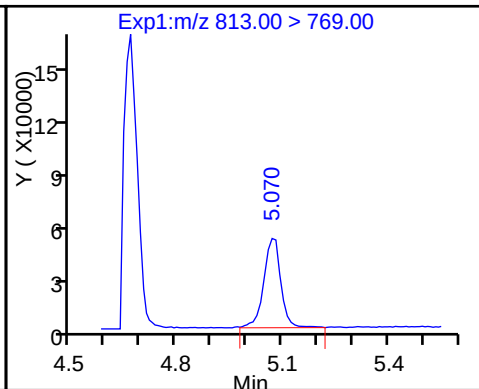
42 Perfluorotetradecanoic acid



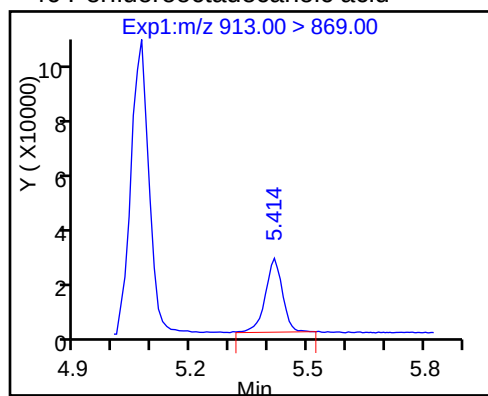
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_005.d  
 Lims ID: IC L3 Full  
 Client ID:  
 Sample Type: IC Calib Level: 3  
 Inject. Date: 01-Mar-2017 11:23:51 ALS Bottle#: 30 Worklist Smp#: 4  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L3-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:10 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 12:01:48

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|

D 1 13C4 PFBA

217.00 > 172.00 1.555 1.553 0.002 14456536 49.5 98.9 922551

2 Perfluorobutyric acid

212.90 > 169.00 1.555 1.558 -0.003 1.000 1286888 5.25 105 14254

D 3 13C5-PFPeA

267.90 > 223.00 1.833 1.832 0.001 11537165 49.7 99.4 809835

4 Perfluoropentanoic acid

262.90 > 219.00 1.833 1.835 -0.002 1.000 1164625 5.16 103 11285

5 Perfluorobutanesulfonic acid

298.90 > 80.00 1.873 1.872 0.001 1.000 1989498 4.83 109

298.90 > 99.00 1.873 1.872 0.001 1.000 781702 2.55(0.00-0.00) 109

6 Perfluorohexanoic acid

313.00 > 269.00 2.129 2.133 -0.004 1.000 966638 5.30 106 49503

D 7 13C2 PFHxA

315.00 > 270.00 2.138 2.134 0.004 10261028 48.7 97.3 342136

10 Perfluoroheptanoic acid

363.00 > 319.00 2.471 2.474 -0.003 1.000 941301 4.96 99.1 8016

D 9 13C4-PFHpA

367.00 > 322.00 2.471 2.475 -0.004 9817002 50.9 102 288379

8 Perfluorohexanesulfonic acid

399.00 > 80.00 2.456 2.485 -0.029 1.000 1348890 4.56 100

D 11 18O2 PFHxS

403.00 > 84.00 2.487 2.489 -0.002 13610529 46.8 98.9 351937

D 12 M2-6:2FTS

429.00 > 409.00 2.806 2.805 0.001 3657293 47.4 99.8

13 Sodium 1H,1H,2H,2H-perfluorooctane

427.00 > 407.00 2.798 2.807 -0.009 1.000 347809 4.96 105

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        | M     |
| 413.00 > 369.00                       | 2.829 | 2.835  | -0.006 | 1.000  | 1102619  | 5.15         |                 | 103  | 10643  | M     |
| 413.00 > 169.00                       | 2.829 | 2.835  | -0.006 | 1.000  | 620161   |              | 1.78(0.90-1.10) | 103  | 22054  | M     |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.829 | 2.835  | -0.006 |        | 10473721 | 51.1         |                 | 102  | 311740 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.845 | 2.842  | 0.003  | 1.000  | 1268398  | 5.17         |                 | 109  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        | M     |
| 499.00 > 80.00                        | 3.171 | 3.145  | 0.026  | 1.000  | 1092724  | 4.67         |                 | 101  | 18758  |       |
| 499.00 > 99.00                        | 3.196 | 3.145  | 0.051  | 1.008  | 254615   |              | 4.29(0.90-1.10) | 101  | 16421  | M     |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.205 | 3.202  | 0.003  | 1.000  | 858327   | 5.38         |                 | 108  | 23748  |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.196 | 3.204  | -0.008 |        | 11369327 | 47.1         |                 | 98.4 | 321748 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.205 | 3.208  | -0.003 |        | 8821496  | 49.6         |                 | 99.2 | 242559 |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.548 | 3.545  | 0.003  |        | 4555474  | 49.2         |                 | 103  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.539 | 3.546  | -0.007 | 0.998  | 444929   | 4.98         |                 | 104  |        |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.556 | 3.559  | -0.003 |        | 18858766 | 51.4         |                 | 103  | 371997 |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.556 | 3.560  | -0.004 | 1.000  | 784974   | 4.99         |                 | 99.8 | 29400  |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.556 | 3.560  | -0.004 |        | 8688810  | 52.1         |                 | 104  | 216415 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.556 | 3.561  | -0.005 | 1.000  | 1747629  | 5.16         |                 | 103  | 92835  |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.707 | 3.710  | -0.003 |        | 4251681  | 49.9         |                 | 99.8 |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.707 | 3.713  | -0.006 | 1.000  | 424299   | 5.14         |                 | 103  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.861 | 3.866  | -0.005 | 1.000  | 717648   | 5.07         |                 | 105  |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.869 | 3.875  | -0.006 |        | 4300641  | 52.9         |                 | 106  |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.869 | 3.876  | -0.007 |        | 6730080  | 51.5         |                 | 103  | 147236 |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.878 | 3.878  | 0.0    | 1.000  | 676308   | 4.96         |                 | 99.1 | 20230  |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.878 | 3.883  | -0.005 | 1.002  | 385576   | 4.92         |                 | 98.5 |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.047 | 4.050  | -0.003 |        | 4436424  | 50.4         |                 | 101  |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.056 | 4.057  | -0.001 | 1.000  | 404698   | 4.88         |                 | 97.5 |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.161 | 4.162  | -0.001 | 1.000  | 578671   | 4.99         |                 | 99.8 | 4705   |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.161 | 4.164     | -0.003    |           | 6339474  | 51.1            |                 | 102  | 145230 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.228 | 4.235     | -0.007    |           | 4273681  | 50.1            |                 | 100  |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.237 | 4.242     | -0.005    | 1.000     | 425282   | 5.06            |                 | 101  |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.421 | 4.424     | -0.003    | 1.000     | 562473   | 5.08            |                 | 102  | 11889  |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.655 | 4.655     | 0.0       |           | 13496732 | 52.1            |                 | 104  | 332789 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.655 | 4.657     | -0.002    | 1.000     | 1324493  | 5.31            |                 | 106  | 11007  |       |
| 713.00 > 169.00                       | 4.645 | 4.657     | -0.012    | 0.998     | 177791   |                 | 7.45(0.00-0.00) | 106  | 28707  |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.057 | 5.057     | 0.0       |           | 6378393  | 51.0            |                 | 102  | 93636  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.057 | 5.059     | -0.002    | 1.000     | 636153   | 5.04            |                 | 101  | 676    |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.398 | 5.399     | -0.001    | 1.000     | 451116   | 4.96            |                 | 99.2 | 634    |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L3\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_005.d

Injection Date: 01-Mar-2017 11:23:51

Instrument ID: A8\_N

Lims ID: IC L3 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 30

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

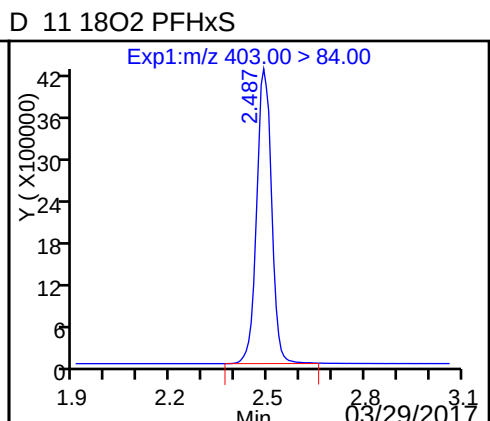
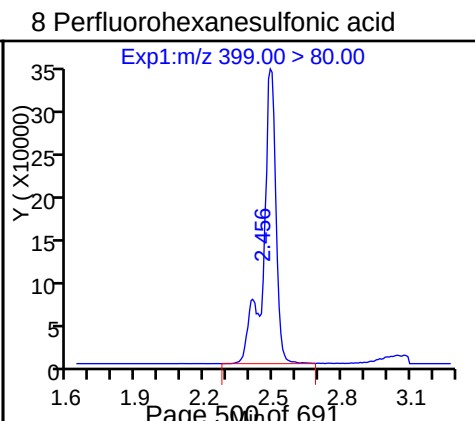
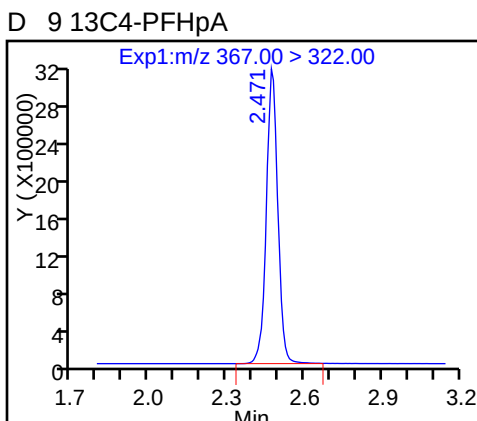
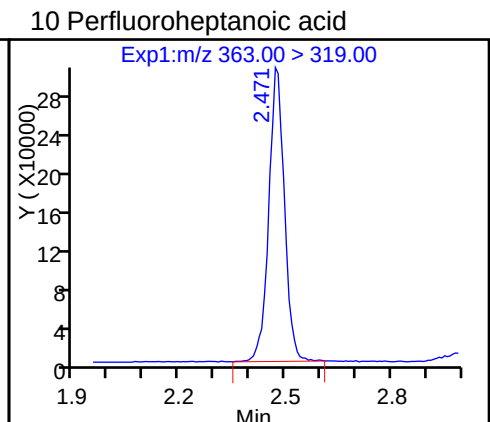
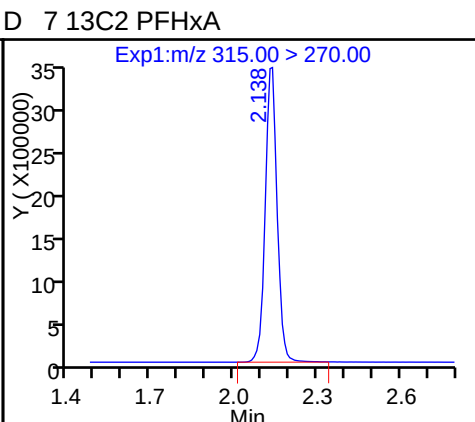
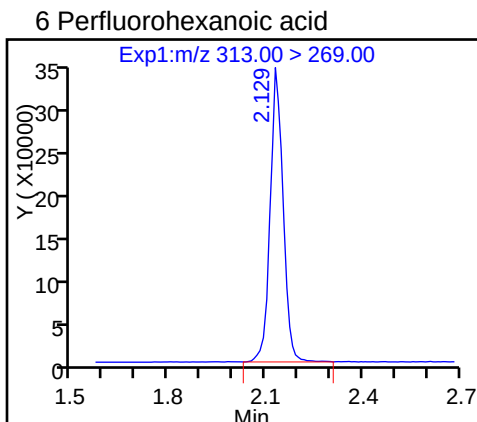
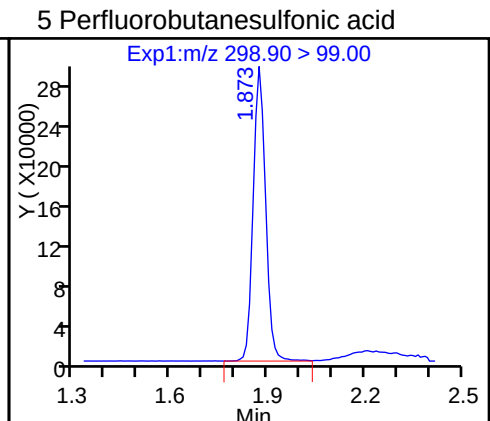
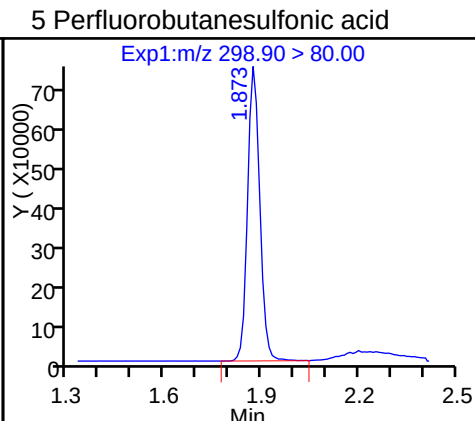
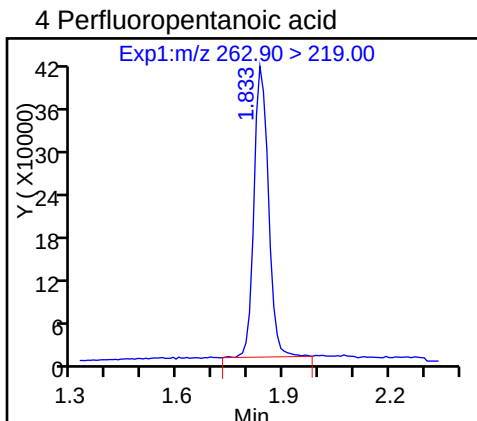
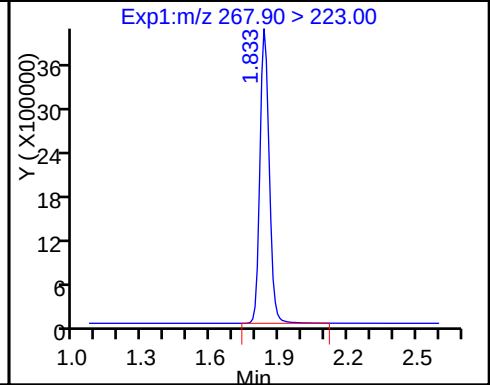
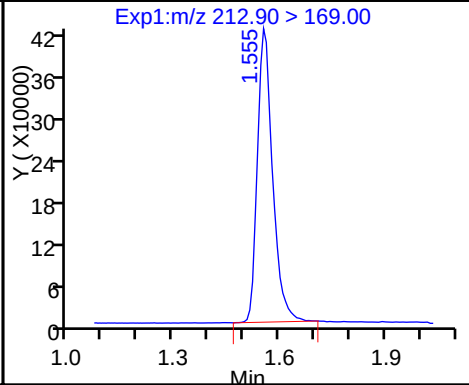
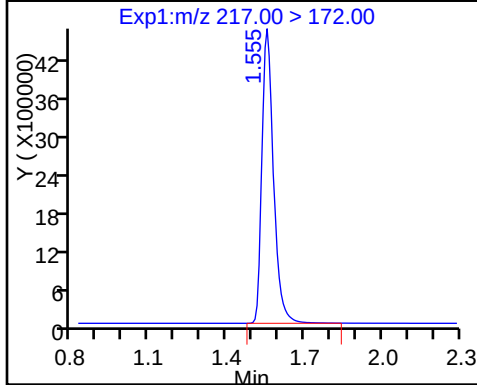
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

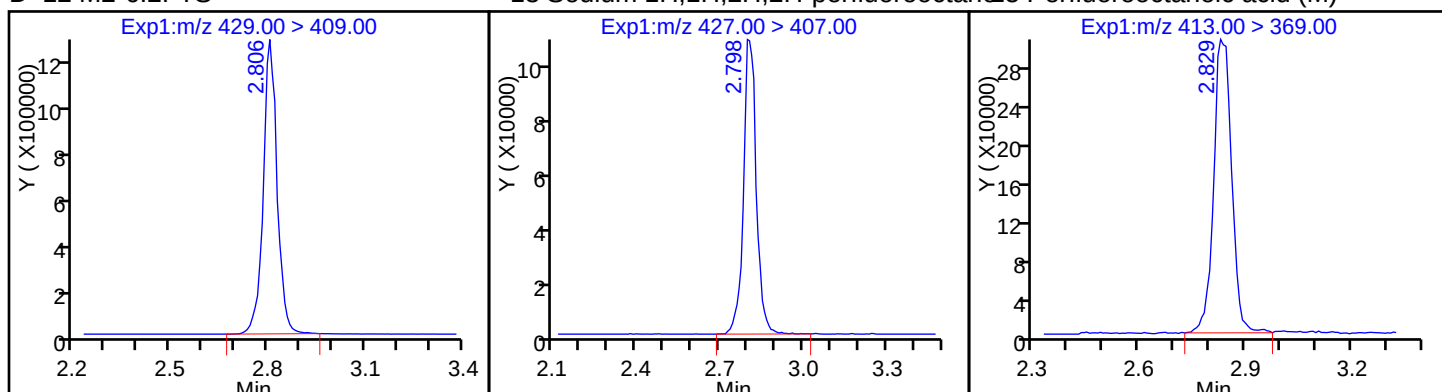
2 Perfluorobutyric acid

D 3 13C5-PFPeA



D 12 M2-6:2FTS

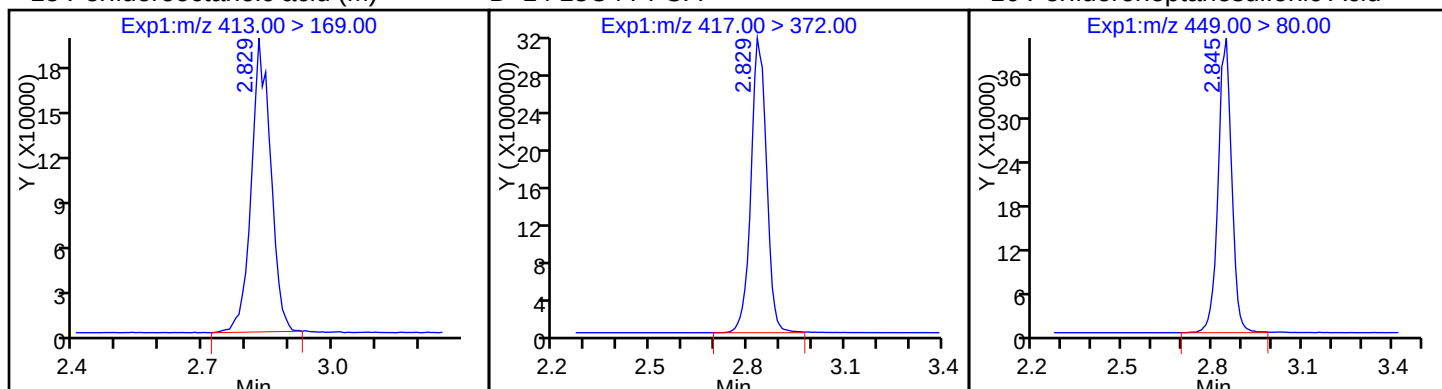
13 Sodium 1H,1H,2H,2H-perfluorooctan-1-ol 15 Perfluorooctanoic acid (M)



15 Perfluorooctanoic acid (M)

D 14 13C4 PFOA

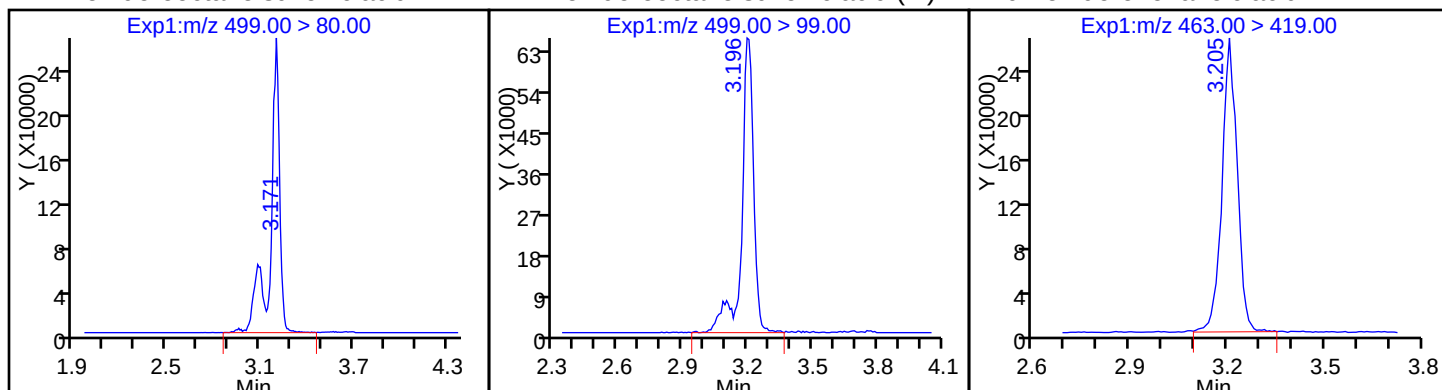
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid (M)

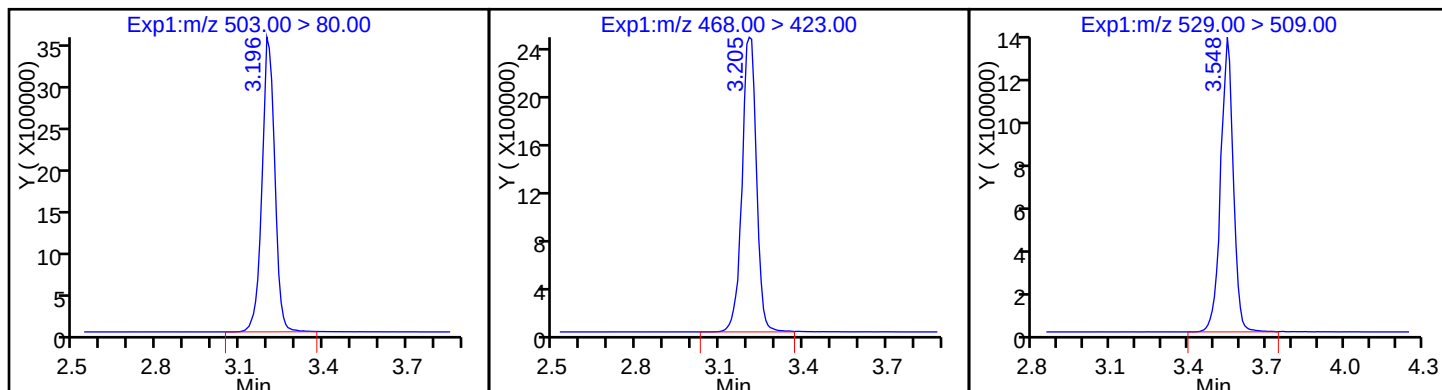
20 Perfluorononanoic acid



D 18 13C4 PFOS

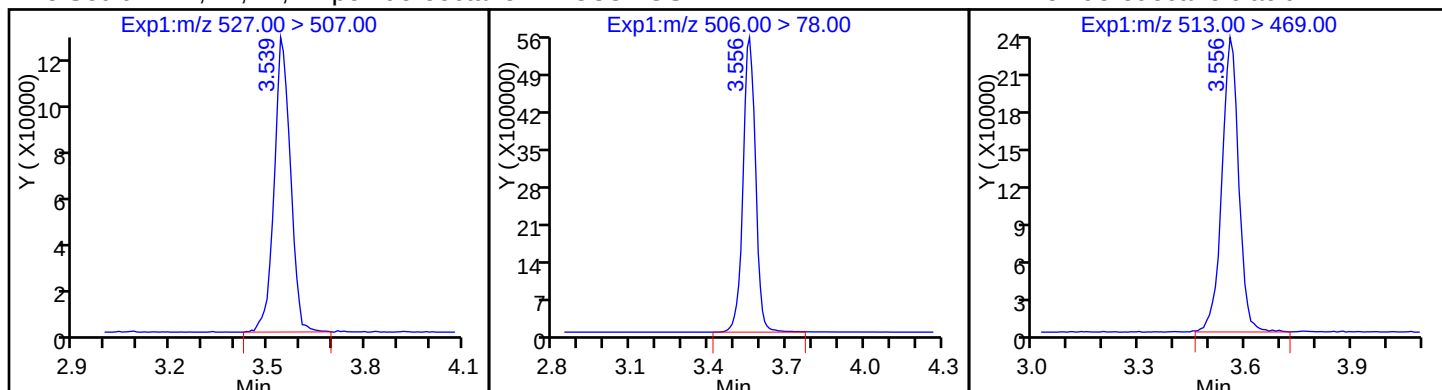
D 19 13C5 PFNA

D 26 M2-8:2FTS



## 25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

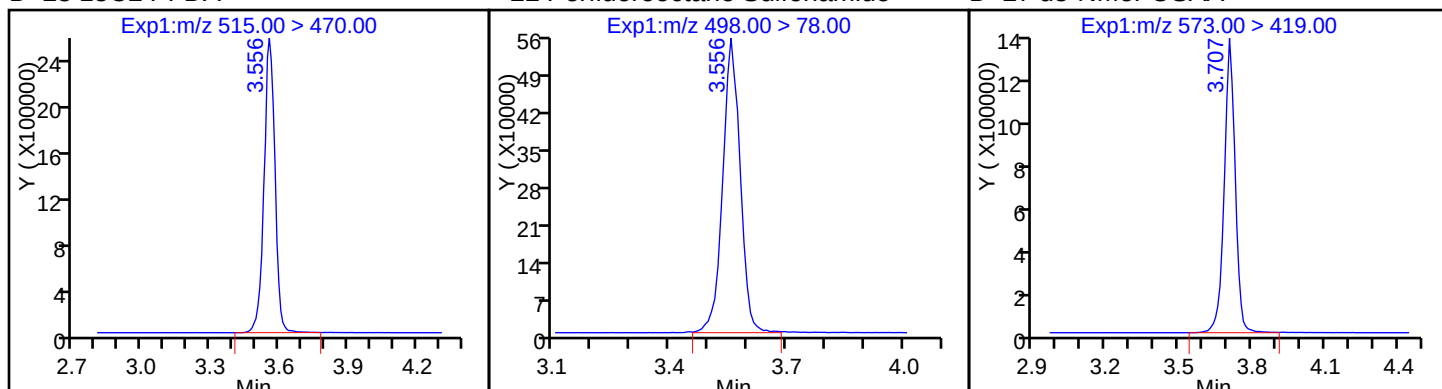
## 24 Perfluorodecanoic acid



## D 23 13C2 PFDA

## 22 Perfluorooctane Sulfonamide

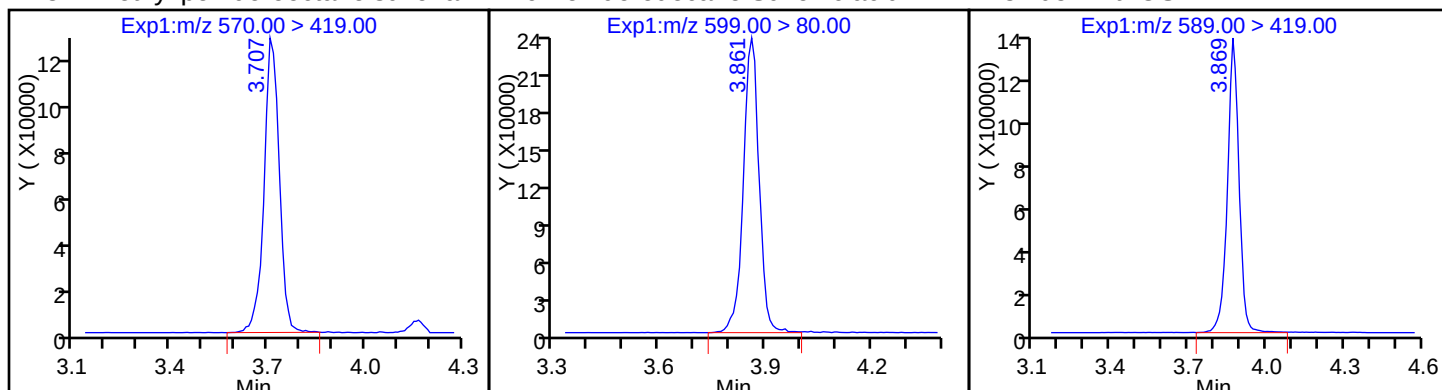
## D 27 d3-NMeFOSAA



## 28 N-methyl perfluorooctane sulfonami

## 29 Perfluorodecane Sulfonic acid

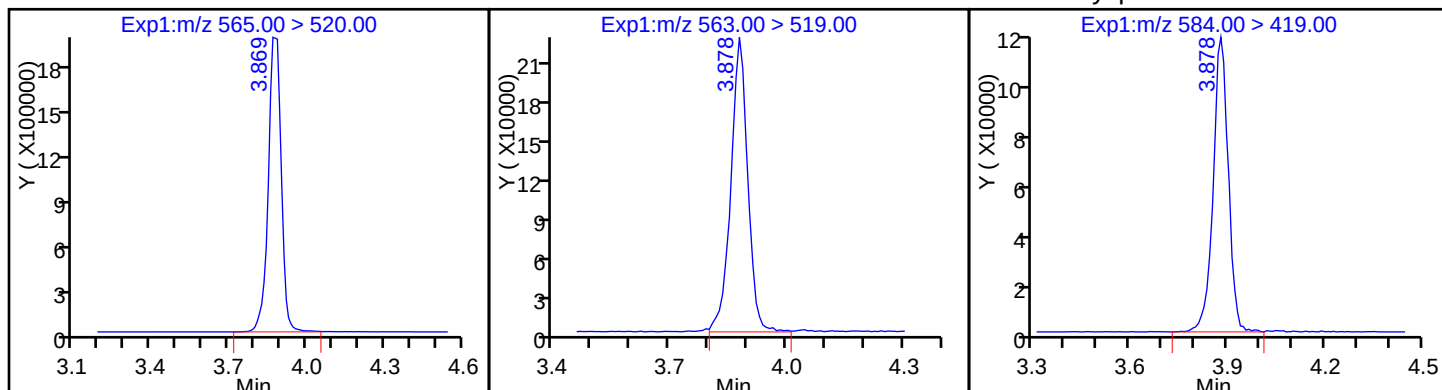
## D 32 d5-NEtFOSAA



## D 30 13C2 PFUnA

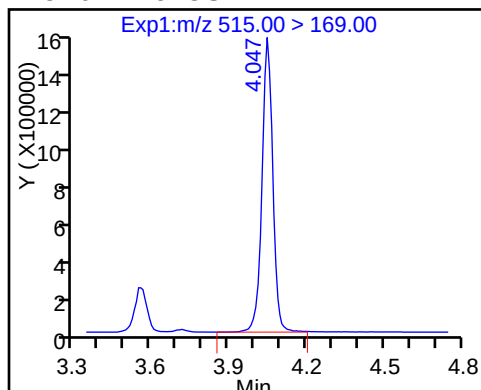
## 31 Perfluoroundecanoic acid

## 33 N-ethyl perfluorooctane sulfonamid

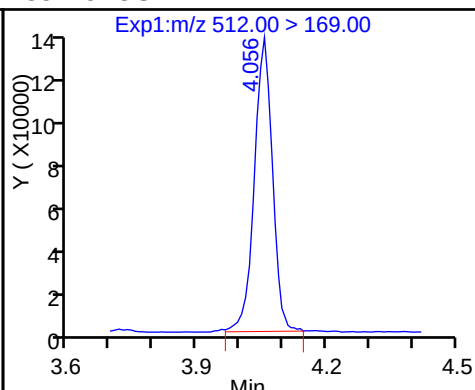




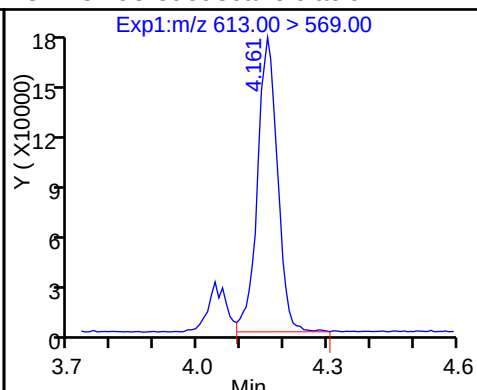
D 34 d-N-MeFOSA-M



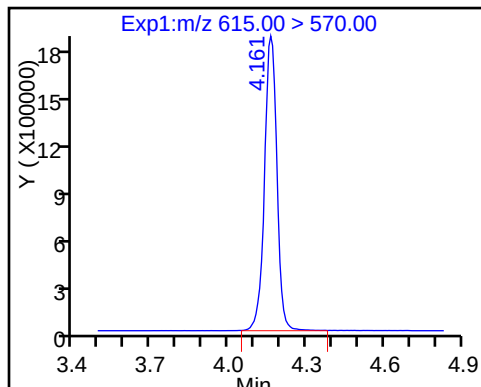
35 MeFOSA



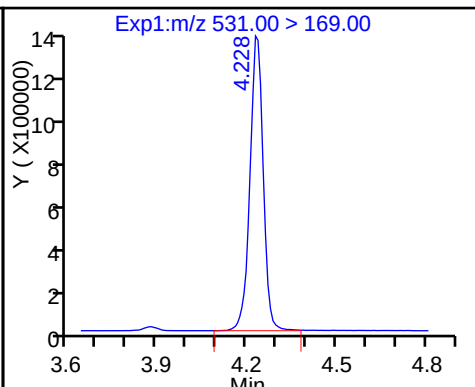
37 Perfluorododecanoic acid



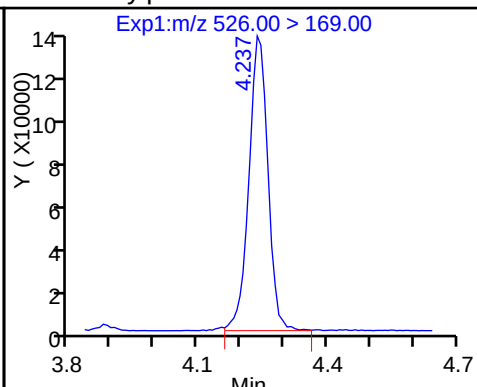
D 36 13C2 PFDaA



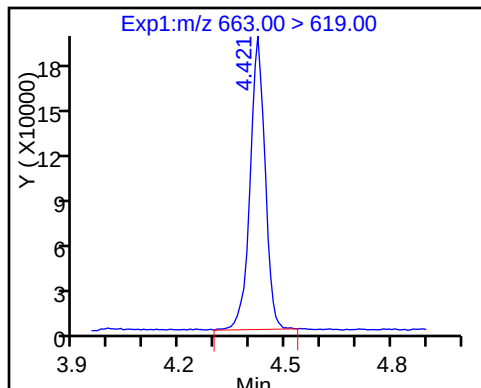
D 38 d-N-EtFOSA-M



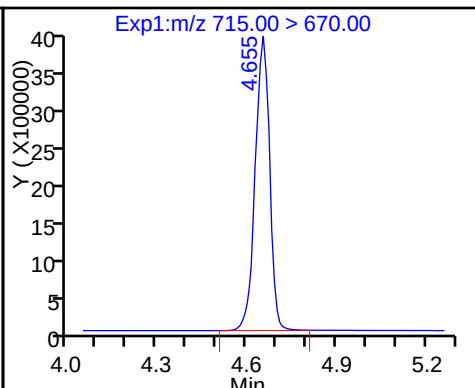
39 N-ethylperfluoro-1-octanesulfonami



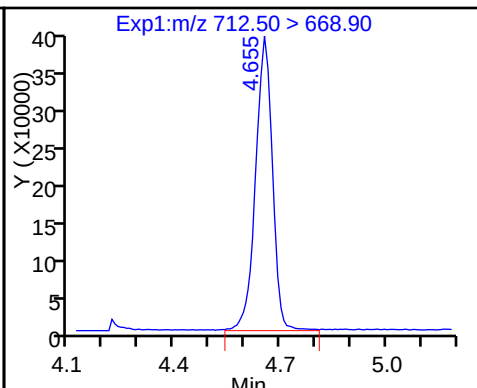
41 Perfluorotridecanoic acid



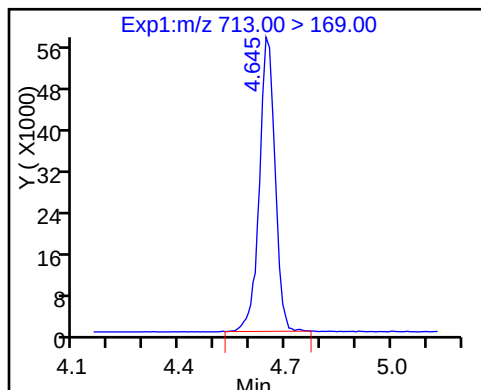
D 43 13C2-PFTeDA



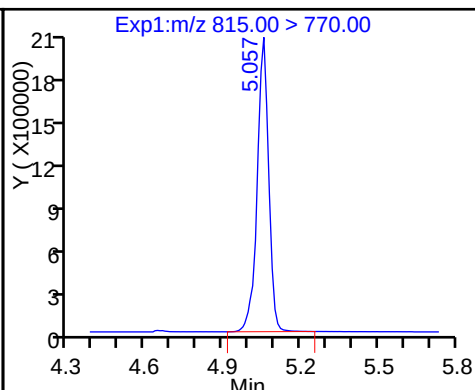
42 Perfluorotetradecanoic acid



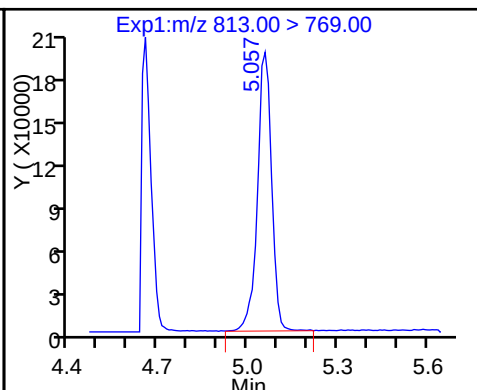
42 Perfluorotetradecanoic acid



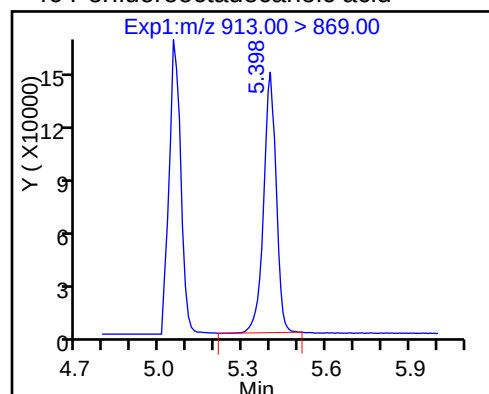
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

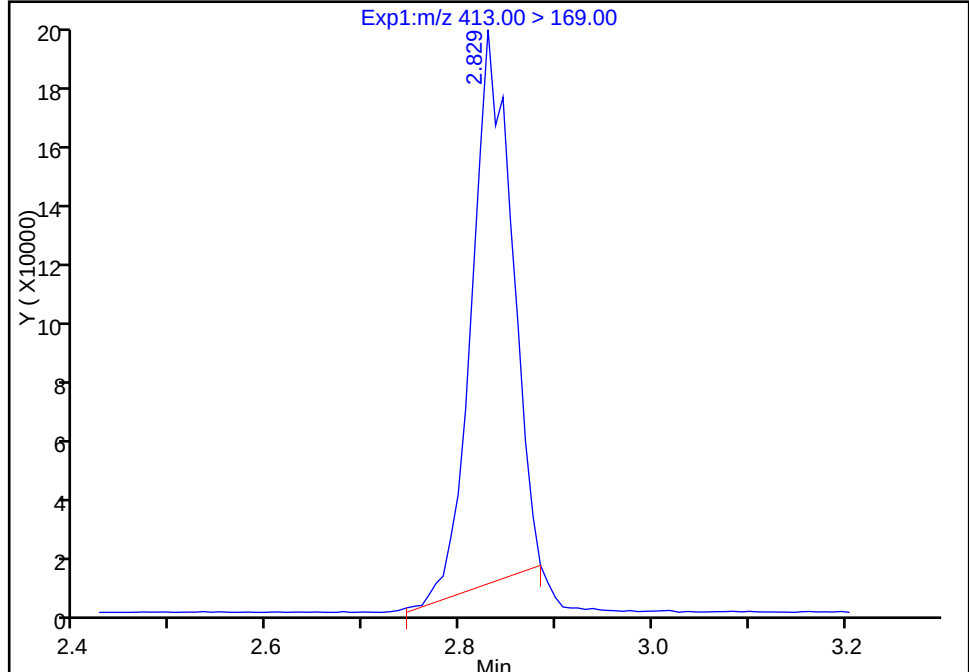
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_005.d  
Injection Date: 01-Mar-2017 11:23:51 Instrument ID: A8\_N  
Lims ID: IC L3 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 30 Worklist Smp#: 4  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

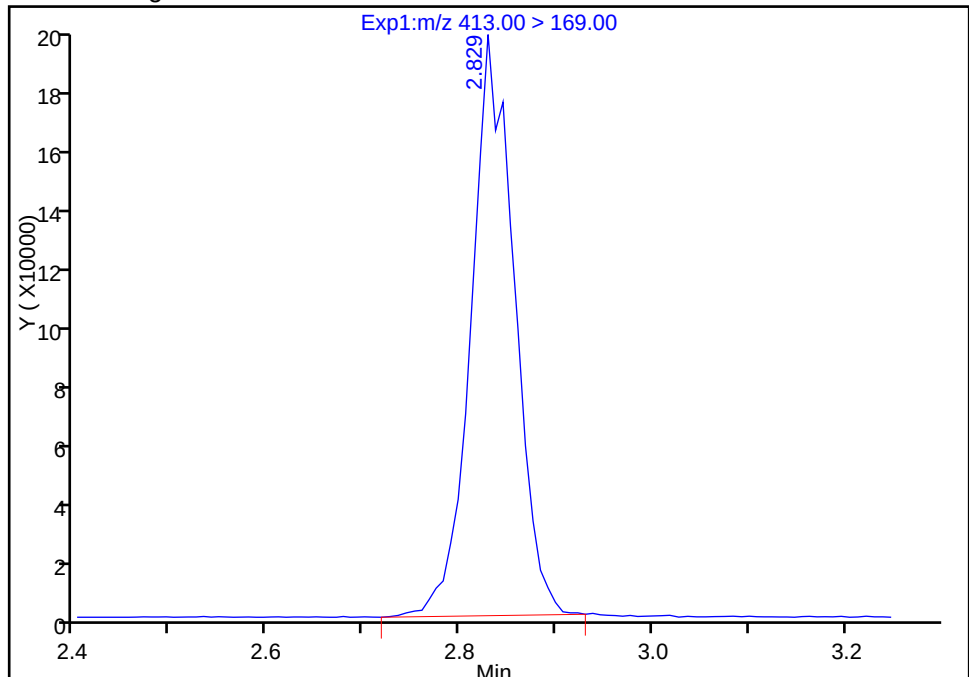
RT: 2.83  
Area: 545337  
Amount: 5.278222  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.83  
Area: 620161  
Amount: 5.152153  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:10

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_005.d

Injection Date: 01-Mar-2017 11:23:51

Instrument ID: A8\_N

Lims ID: IC L3 Full

Client ID:

Operator ID: A8-PCVA8

ALS Bottle#:

30

Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor:

1.0000

Method: A8\_N

Limit Group:

LC PFC\_DOD ICAL

Column:

Detector

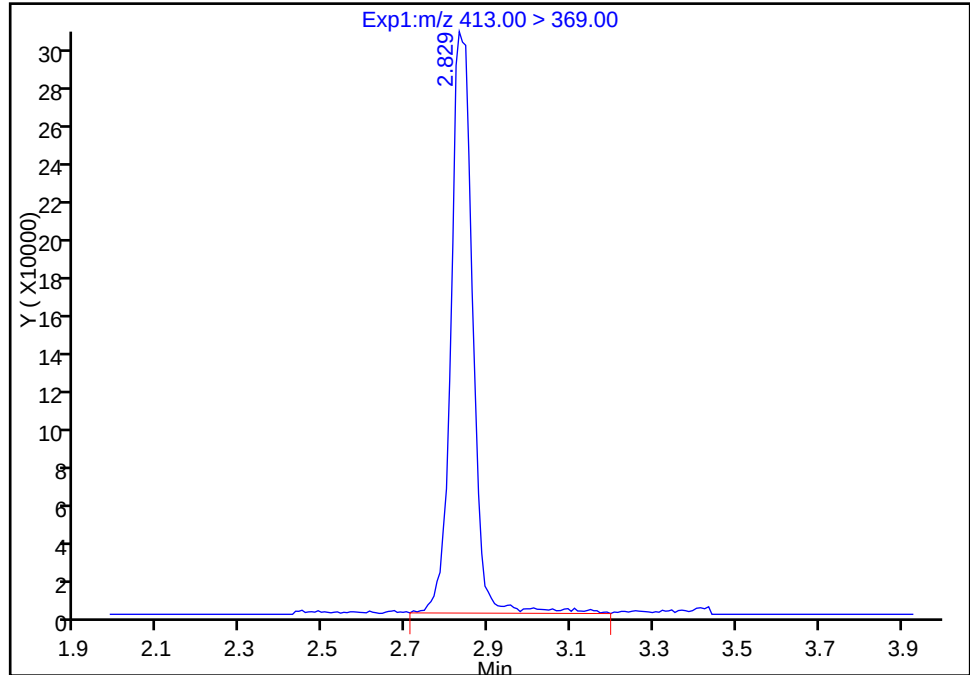
EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

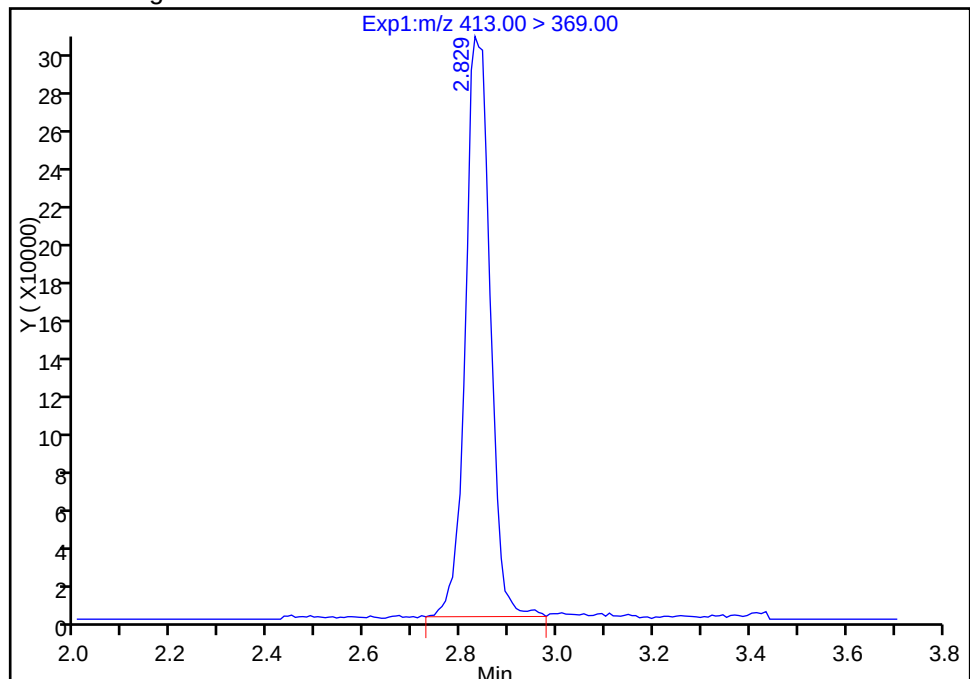
RT: 2.83  
Area: 1136820  
Amount: 5.278222  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.83  
Area: 1102619  
Amount: 5.152153  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:10

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_005.d

Injection Date: 01-Mar-2017 11:23:51

Instrument ID: A8\_N

Lims ID: IC L3 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 30 Worklist Smp#: 4

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

Column:

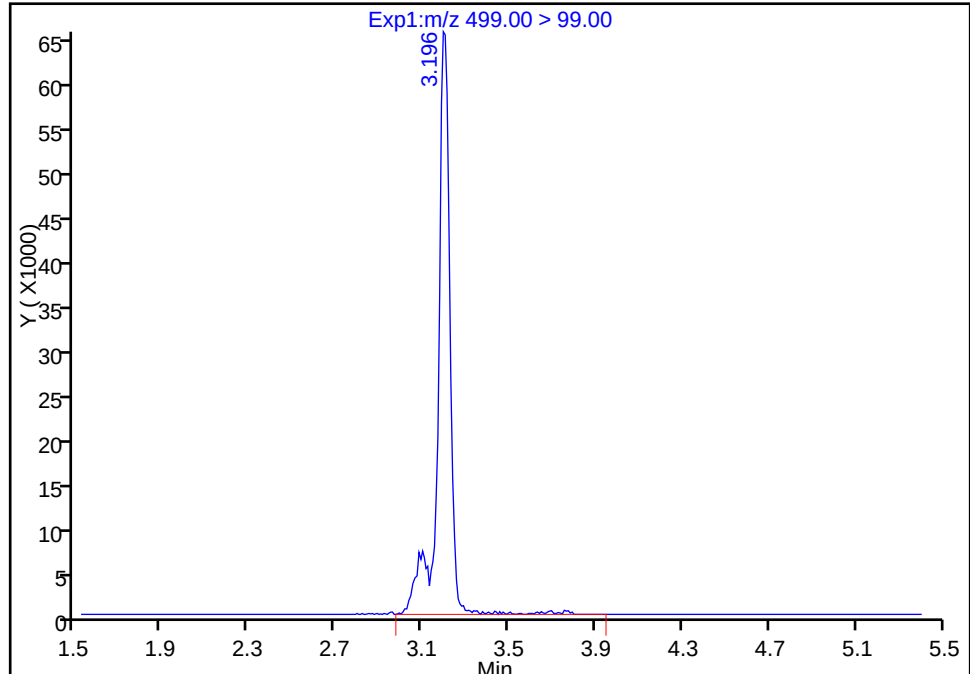
Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

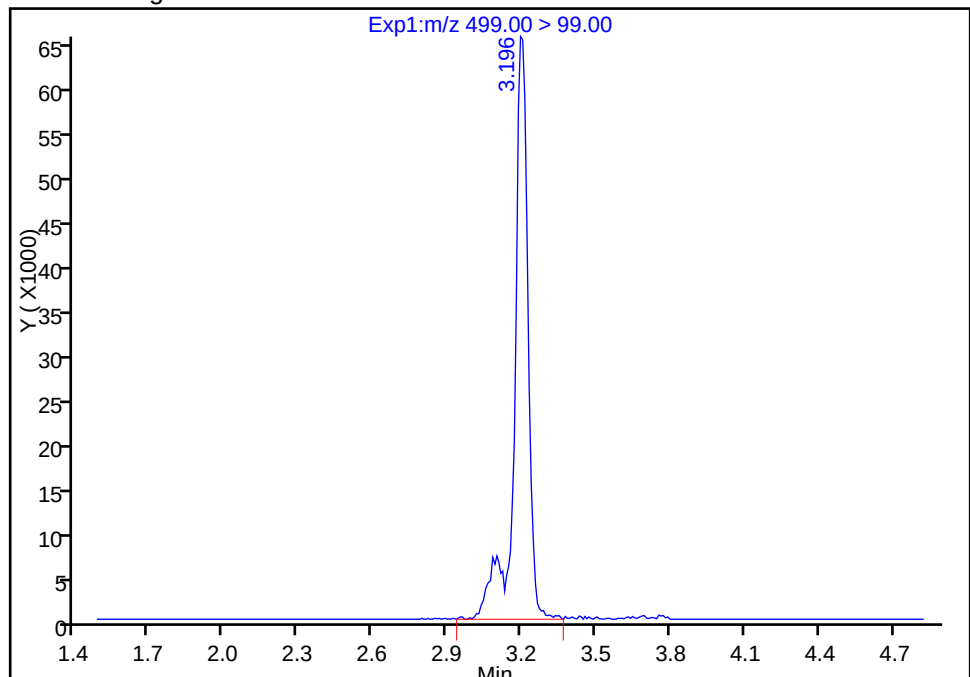
RT: 3.20  
Area: 258504  
Amount: 4.907745  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 254615  
Amount: 4.671293  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:10

Audit Action: Manually Integrated

Audit Reason: Baseline

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_006.d  
 Lims ID: IC L4 Full  
 Client ID:  
 Sample Type: IC Calib Level: 4  
 Inject. Date: 01-Mar-2017 11:31:20 ALS Bottle#: 31 Worklist Smp#: 5  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L4-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:13 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 11:58:53

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N     | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|---------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |         |       |
| 217.00 > 172.00                       | 1.554 | 1.553  | 0.001  |        | 17122661 | 58.6         |                 | 117  | 1074272 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |         |       |
| 212.90 > 169.00                       | 1.562 | 1.558  | 0.004  | 1.000  | 5946494  | 20.5         |                 | 102  | 65761   |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |         |       |
| 267.90 > 223.00                       | 1.832 | 1.832  | 0.0    |        | 13641103 | 58.7         |                 | 117  | 917353  |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |         |       |
| 262.90 > 219.00                       | 1.841 | 1.835  | 0.006  | 1.000  | 5283919  | 19.8         |                 | 99.0 | 51812   |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |         |       |
| 298.90 > 80.00                        | 1.871 | 1.872  | -0.001 | 1.000  | 9035699  | 18.8         |                 | 106  |         |       |
| 298.90 > 99.00                        | 1.871 | 1.872  | -0.001 | 1.000  | 3688779  |              | 2.45(0.00-0.00) | 106  |         |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |         |       |
| 313.00 > 269.00                       | 2.134 | 2.133  | 0.001  | 1.000  | 4191655  | 19.2         |                 | 96.2 | 152557  |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |         |       |
| 315.00 > 270.00                       | 2.134 | 2.134  | 0.0    |        | 12244217 | 58.1         |                 | 116  | 400533  |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |         |       |
| 363.00 > 319.00                       | 2.471 | 2.474  | -0.003 | 1.000  | 4154809  | 19.6         |                 | 98.2 | 36084   |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |         |       |
| 367.00 > 322.00                       | 2.479 | 2.475  | 0.004  |        | 10934944 | 56.7         |                 | 113  | 304443  |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |         | M     |
| 399.00 > 80.00                        | 2.487 | 2.485  | 0.002  | 1.000  | 5958886  | 17.2         |                 | 94.6 |         | M     |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |         |       |
| 403.00 > 84.00                        | 2.487 | 2.489  | -0.002 |        | 15910284 | 54.7         |                 | 116  | 422002  |       |
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |         |       |
| 429.00 > 409.00                       | 2.814 | 2.805  | 0.009  |        | 4091935  | 53.0         |                 | 112  |         |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |         |       |
| 427.00 > 407.00                       | 2.806 | 2.807  | -0.001 | 1.000  | 1476276  | 19.2         |                 | 101  |         |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 14 13C4 PFOA                        |       |           |           |           |          |                 |                 |      |        |       |
| 417.00 > 372.00                       | 2.837 | 2.835     | 0.002     |           | 11808824 | 57.6            |                 | 115  | 419758 |       |
| 15 Perfluorooctanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 413.00 > 369.00                       | 2.837 | 2.835     | 0.002     | 1.000     | 4651144  | 19.3            |                 | 96.4 | 85963  |       |
| 413.00 > 169.00                       | 2.837 | 2.835     | 0.002     | 1.000     | 2647754  |                 | 1.76(0.90-1.10) | 96.4 | 107757 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |           |           |           |          |                 |                 |      |        |       |
| 449.00 > 80.00                        | 2.837 | 2.842     | -0.005    | 1.000     | 5669268  | 19.9            |                 | 105  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 499.00 > 80.00                        | 3.093 | 3.145     | -0.052    | 1.000     | 4889351  | 18.0            |                 | 97.1 | 37486  |       |
| 499.00 > 99.00                        | 3.163 | 3.145     | 0.018     | 1.023     | 1125132  |                 | 4.35(0.90-1.10) | 97.1 | 16340  |       |
| 20 Perfluorononanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 463.00 > 419.00                       | 3.205 | 3.202     | 0.003     | 1.000     | 3633207  | 19.7            |                 | 98.5 | 58134  |       |
| D 18 13C4 PFOS                        |       |           |           |           |          |                 |                 |      |        |       |
| 503.00 > 80.00                        | 3.205 | 3.204     | 0.001     |           | 13187105 | 54.6            |                 | 114  | 308342 |       |
| D 19 13C5 PFNA                        |       |           |           |           |          |                 |                 |      |        |       |
| 468.00 > 423.00                       | 3.214 | 3.208     | 0.006     |           | 10199601 | 57.3            |                 | 115  | 340360 |       |
| D 26 M2-8:2FTS                        |       |           |           |           |          |                 |                 |      |        |       |
| 529.00 > 509.00                       | 3.539 | 3.545     | -0.006    |           | 4873285  | 52.6            |                 | 110  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |           |           |           |          |                 |                 |      |        |       |
| 527.00 > 507.00                       | 3.539 | 3.546     | -0.007    | 1.000     | 1931499  | 20.5            |                 | 107  |        |       |
| D 21 13C8 FOSA                        |       |           |           |           |          |                 |                 |      |        |       |
| 506.00 > 78.00                        | 3.565 | 3.559     | 0.006     |           | 19888389 | 54.2            |                 | 108  | 344996 |       |
| D 23 13C2 PFDA                        |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 470.00                       | 3.565 | 3.560     | 0.005     |           | 9661817  | 58.0            |                 | 116  | 234911 |       |
| 24 Perfluorodecanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 513.00 > 469.00                       | 3.556 | 3.560     | -0.004    | 1.000     | 3277760  | 18.7            |                 | 93.6 | 124974 |       |
| 22 Perfluorooctane Sulfonamide        |       |           |           |           |          |                 |                 |      |        |       |
| 498.00 > 78.00                        | 3.565 | 3.561     | 0.004     | 1.000     | 7187955  | 20.1            |                 | 101  | 199090 |       |
| D 27 d3-NMeFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 573.00 > 419.00                       | 3.707 | 3.710     | -0.003    |           | 4769931  | 56.0            |                 | 112  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 570.00 > 419.00                       | 3.717 | 3.713     | 0.004     | 1.003     | 1695690  | 18.3            |                 | 91.5 |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 599.00 > 80.00                        | 3.862 | 3.866     | -0.004    | 1.000     | 3002868  | 18.3            |                 | 94.8 |        |       |
| D 32 d5-NEtFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 589.00 > 419.00                       | 3.870 | 3.875     | -0.005    |           | 4515915  | 55.5            |                 | 111  |        |       |
| D 30 13C2 PFUnA                       |       |           |           |           |          |                 |                 |      |        |       |
| 565.00 > 520.00                       | 3.879 | 3.876     | 0.003     |           | 7346047  | 56.2            |                 | 112  | 177174 |       |
| 31 Perfluoroundecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 563.00 > 519.00                       | 3.879 | 3.878     | 0.001     | 1.000     | 2619295  | 17.6            |                 | 87.9 | 88246  |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |           |           |           |          |                 |                 |      |        |       |
| 584.00 > 419.00                       | 3.888 | 3.883     | 0.005     | 1.004     | 1606146  | 19.5            |                 | 97.7 |        |       |
| D 34 d-N-MeFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 169.00                       | 4.050 | 4.050     | 0.0       |           | 4579449  | 52.0            |                 | 104  |        |       |
| 35 MeFOSA                             |       |           |           |           |          |                 |                 |      |        |       |
| 512.00 > 169.00                       | 4.059 | 4.057     | 0.002     | 1.000     | 1671133  | 19.5            |                 | 97.5 |        |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 613.00 > 569.00                       | 4.165 | 4.162     | 0.003     | 1.000     | 2353395  | 19.5            |                 | 97.4 | 29732  |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.165 | 4.164     | 0.001     |           | 6606261  | 53.3            |                 | 107  | 130372 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.240 | 4.235     | 0.005     |           | 4373613  | 51.3            |                 | 103  |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.249 | 4.242     | 0.007     | 1.000     | 1676481  | 19.5            |                 | 97.4 |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.418 | 4.424     | -0.006    | 1.000     | 2207561  | 19.1            |                 | 95.6 | 38950  |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.652 | 4.655     | -0.003    |           | 13623388 | 52.6            |                 | 105  | 303779 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.652 | 4.657     | -0.005    | 1.000     | 4960846  | 19.1            |                 | 95.5 | 38169  |       |
| 713.00 > 169.00                       | 4.652 | 4.657     | -0.005    | 1.000     | 658342   |                 | 7.54(0.00-0.00) | 95.5 | 69558  |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.057 | 5.057     | 0.0       |           | 6330845  | 50.6            |                 | 101  | 91907  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.057 | 5.059     | -0.002    | 1.000     | 2071027  | 16.5            |                 | 82.7 | 2327   |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.398 | 5.399     | -0.001    | 1.000     | 1687895  | 17.8            |                 | 89.0 | 2245   |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L4\_00001

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_006.d

Injection Date: 01-Mar-2017 11:31:20

Instrument ID: A8\_N

Lims ID: IC L4 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 31

Worklist Smp#: 5

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

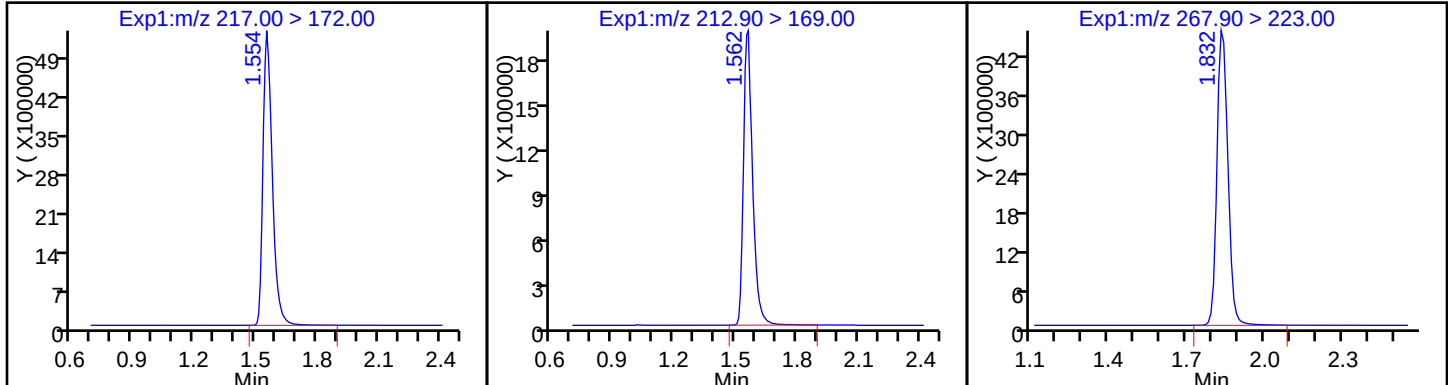
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

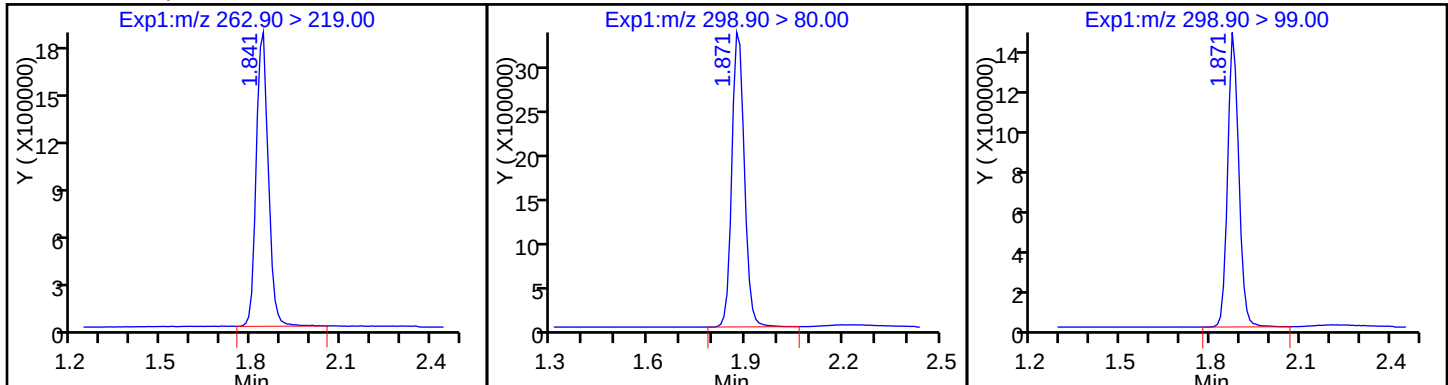
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

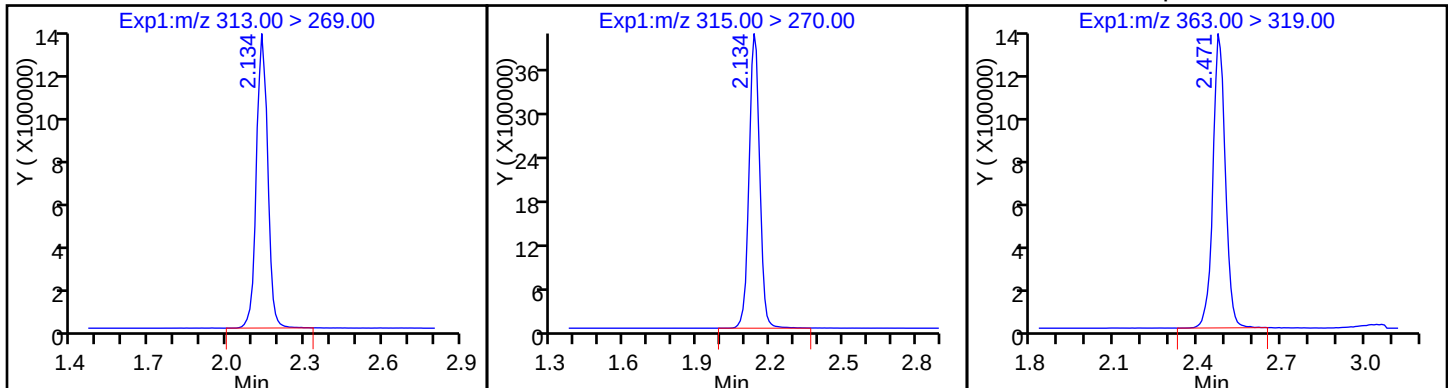
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

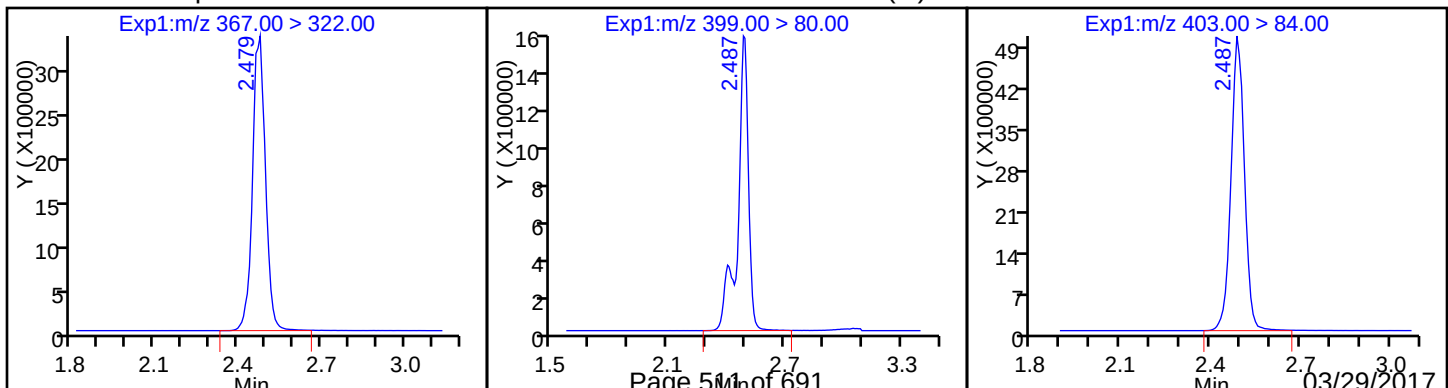
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid (M)

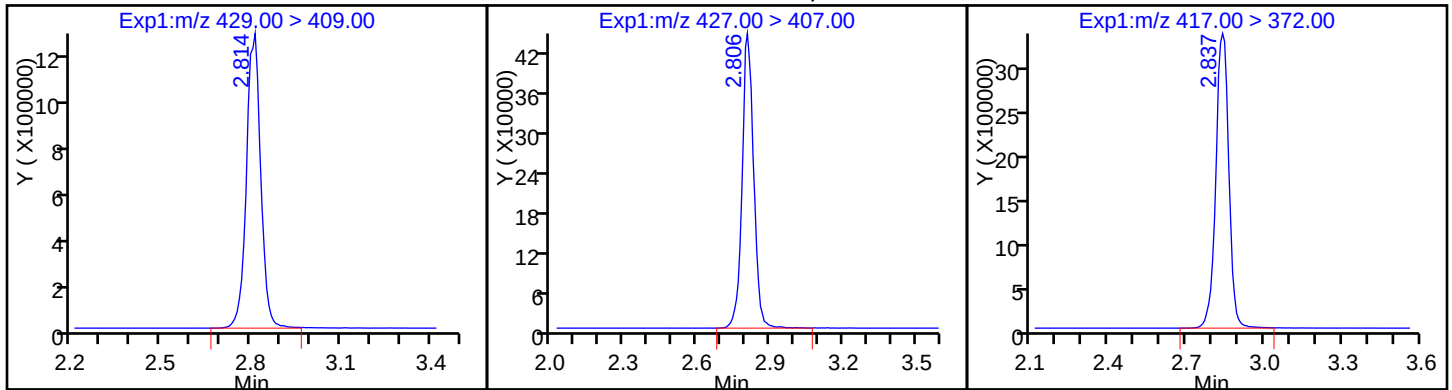
D 11 18O2 PFHxS



D 12 M2-6:2FTS

13 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

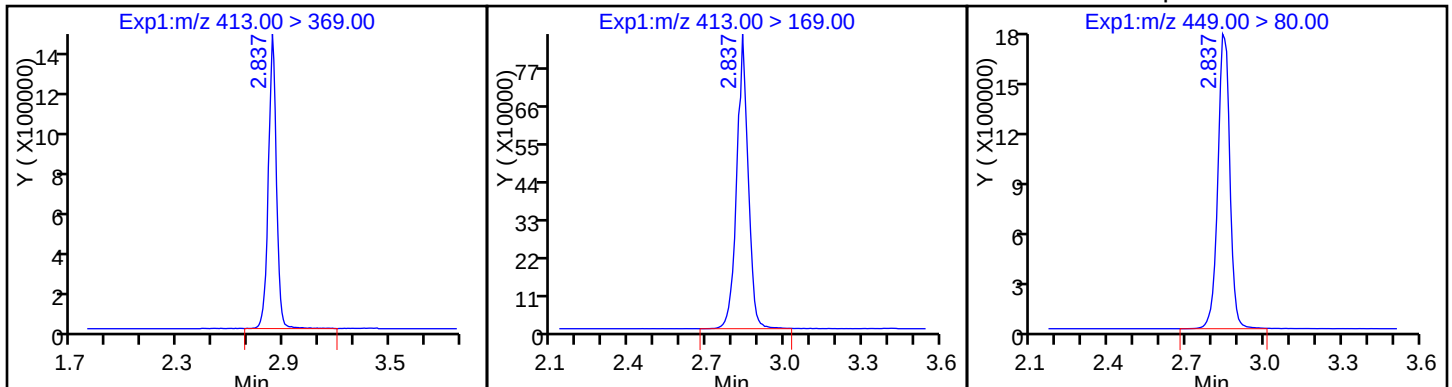
D 14 13C4 PFOA



15 Perfluorooctanoic acid

15 Perfluorooctanoic acid

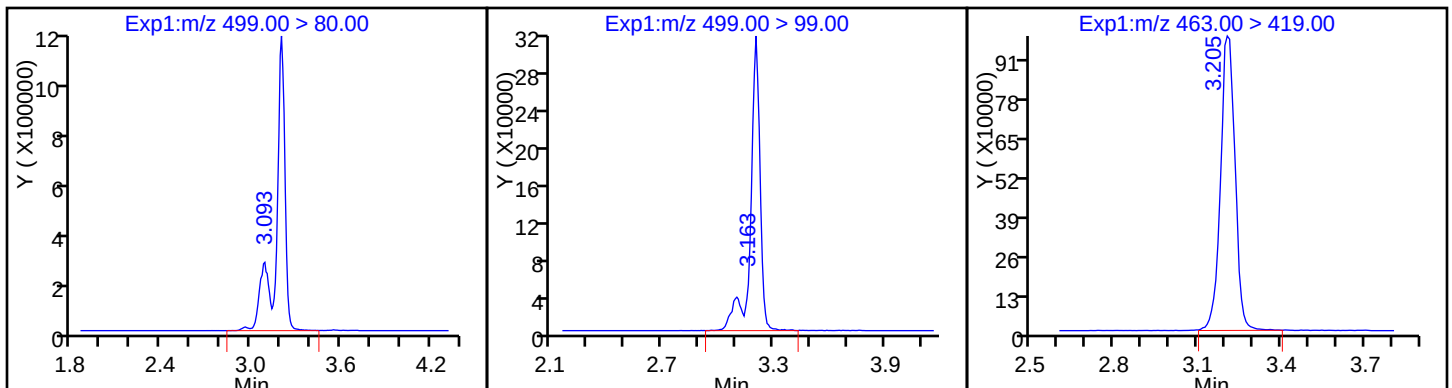
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

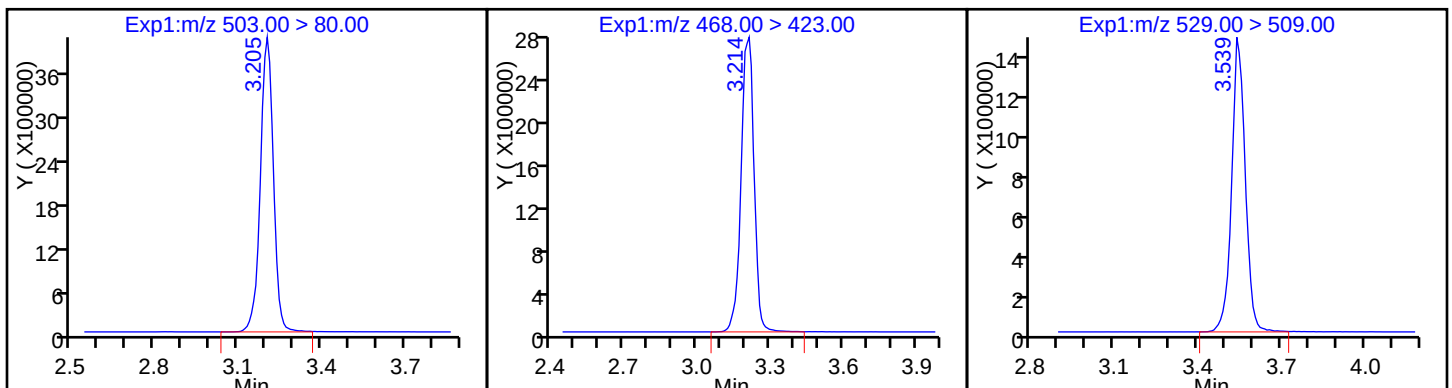
20 Perfluorononanoic acid



D 18 13C4 PFOS

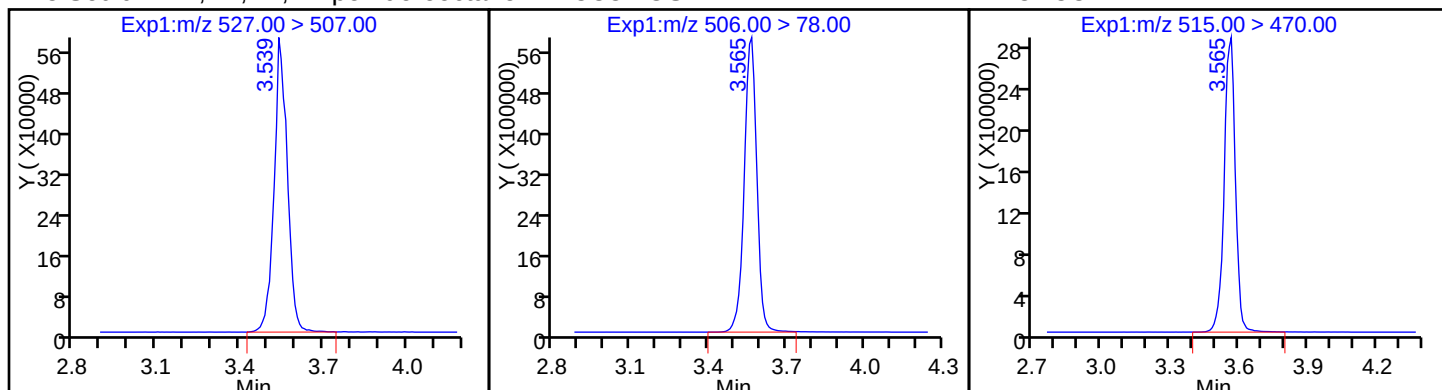
D 19 13C5 PFNA

D 26 M2-8:2FTS



25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

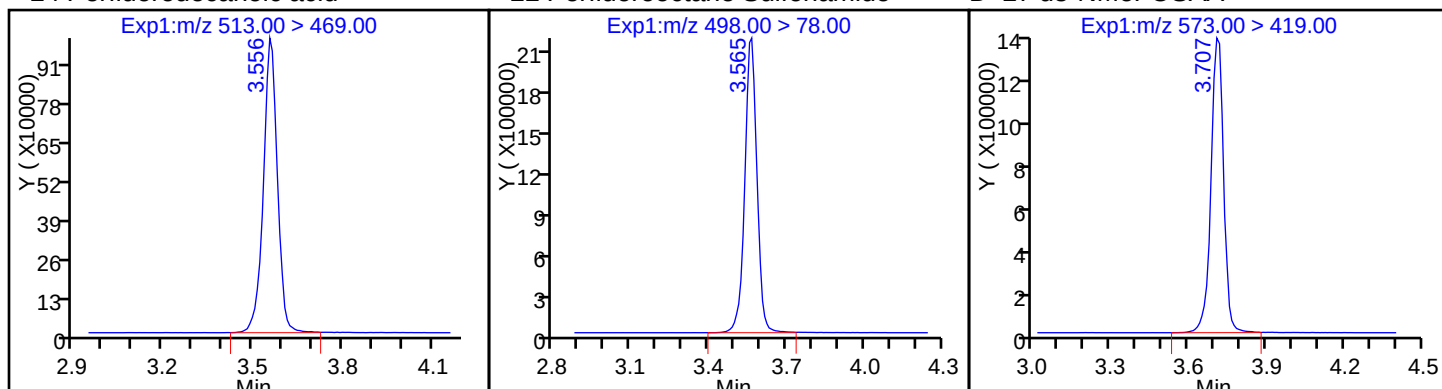
D 23 13C2 PFDA



24 Perfluorodecanoic acid

22 Perfluorooctane Sulfonamide

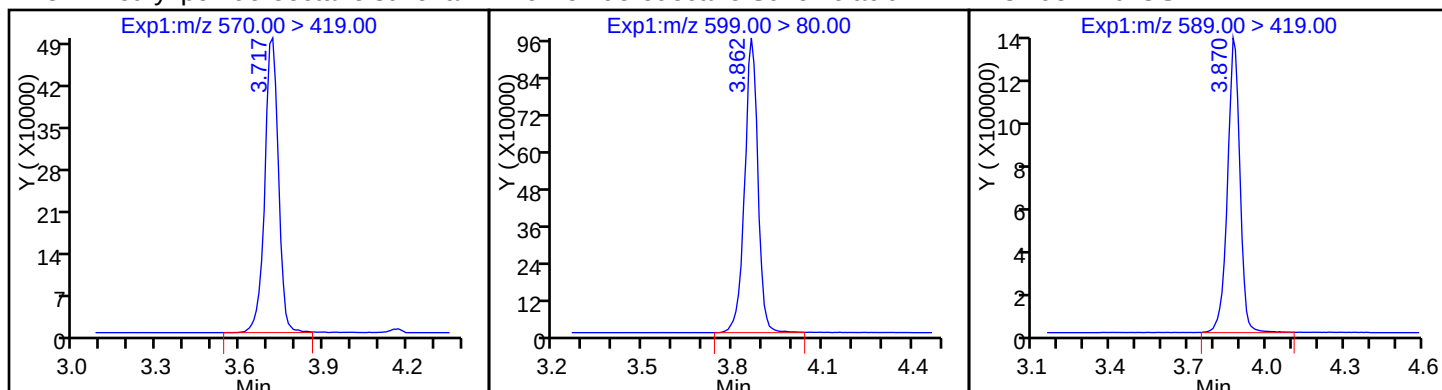
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

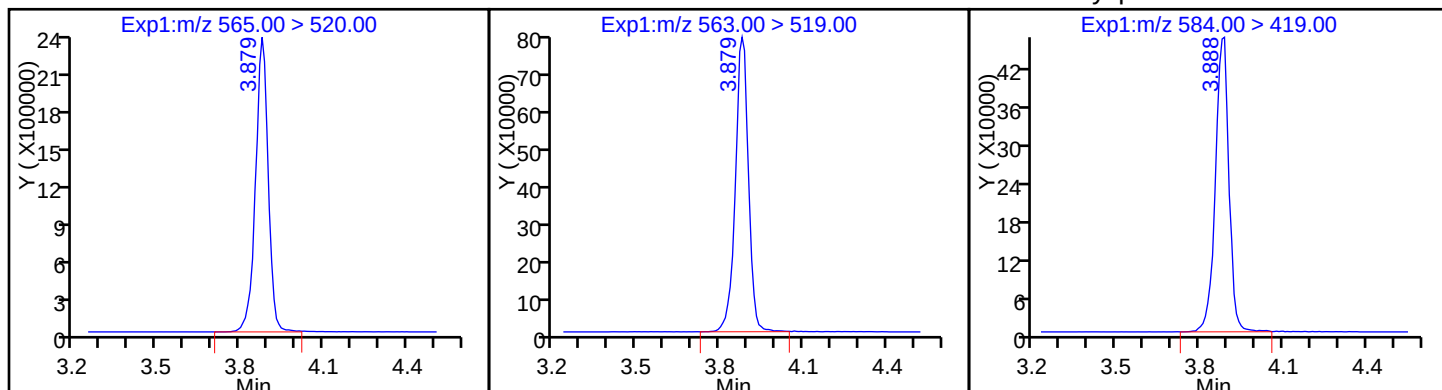
D 32 d5-NEtFOSAA



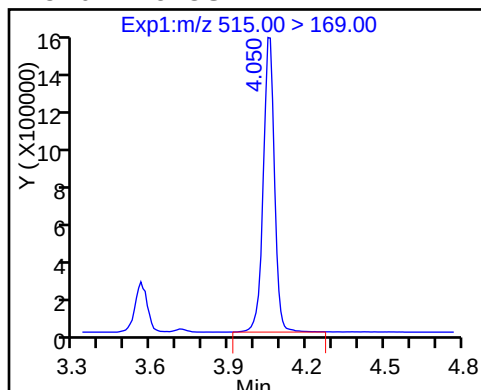
D 30 13C2 PFUnA

31 Perfluoroundecanoic acid

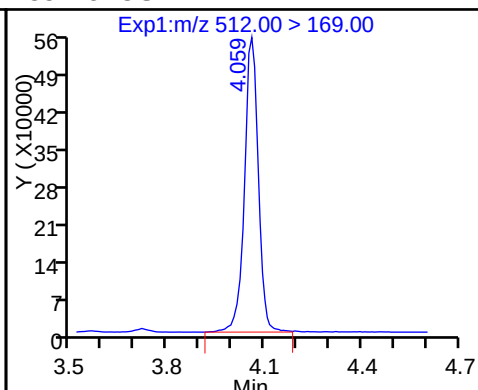
33 N-ethyl perfluorooctane sulfonamid



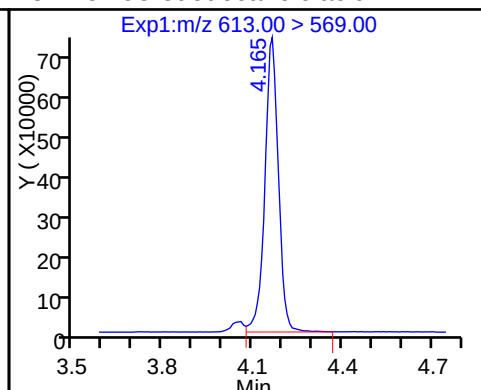
D 34 d-N-MeFOSA-M



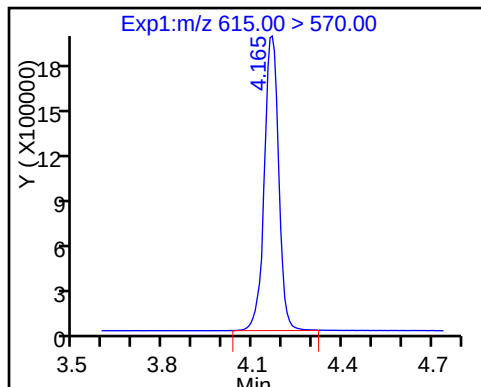
35 MeFOSA



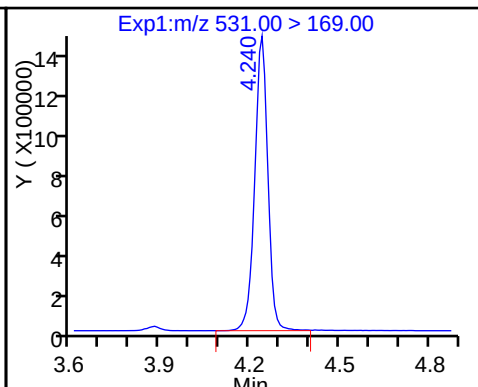
37 Perfluorododecanoic acid



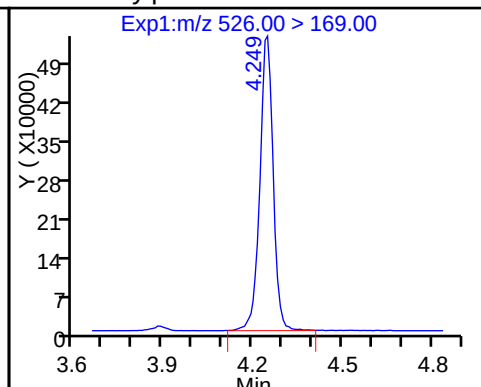
D 36 13C2 PFDaA



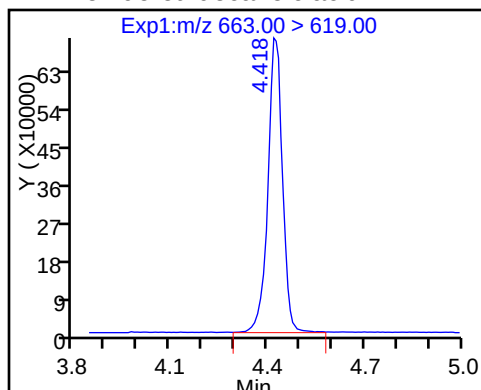
D 38 d-N-EtFOSA-M



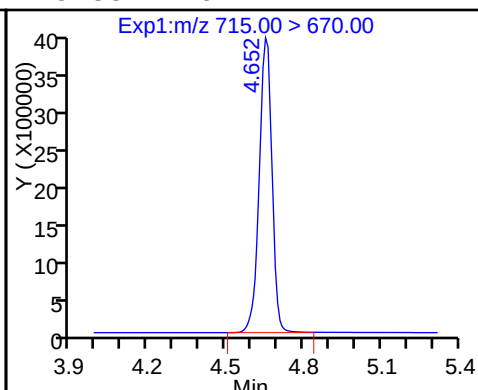
39 N-ethylperfluoro-1-octanesulfonami



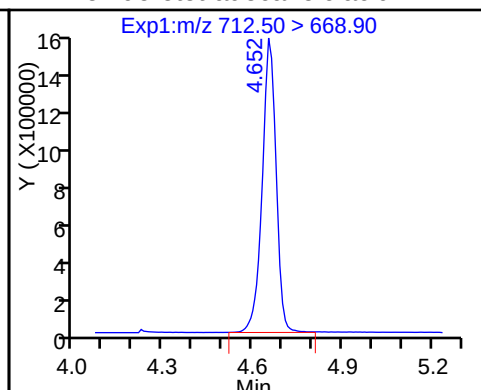
41 Perfluorotridecanoic acid



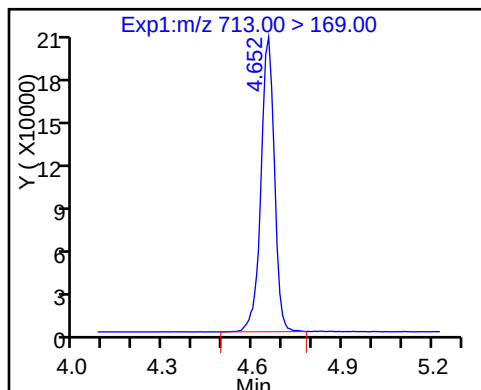
D 43 13C2-PFTeDA



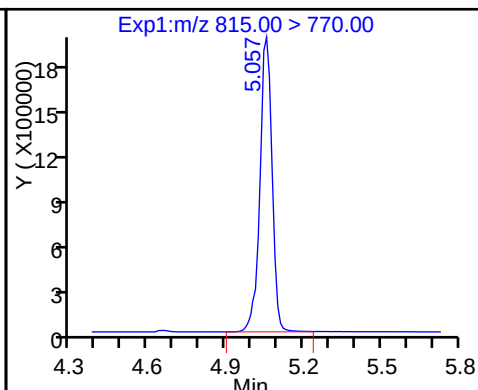
42 Perfluorotetradecanoic acid



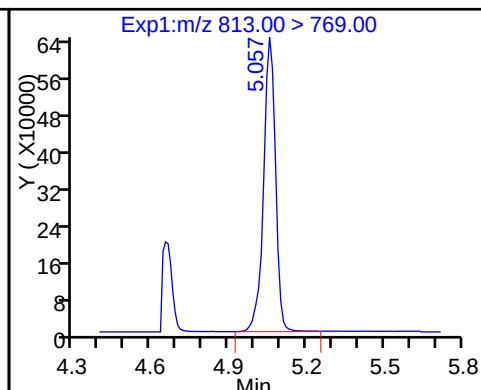
42 Perfluorotetradecanoic acid



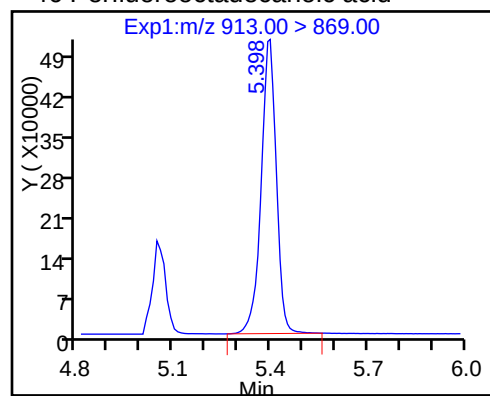
D 44 13C2-PFHxDa



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

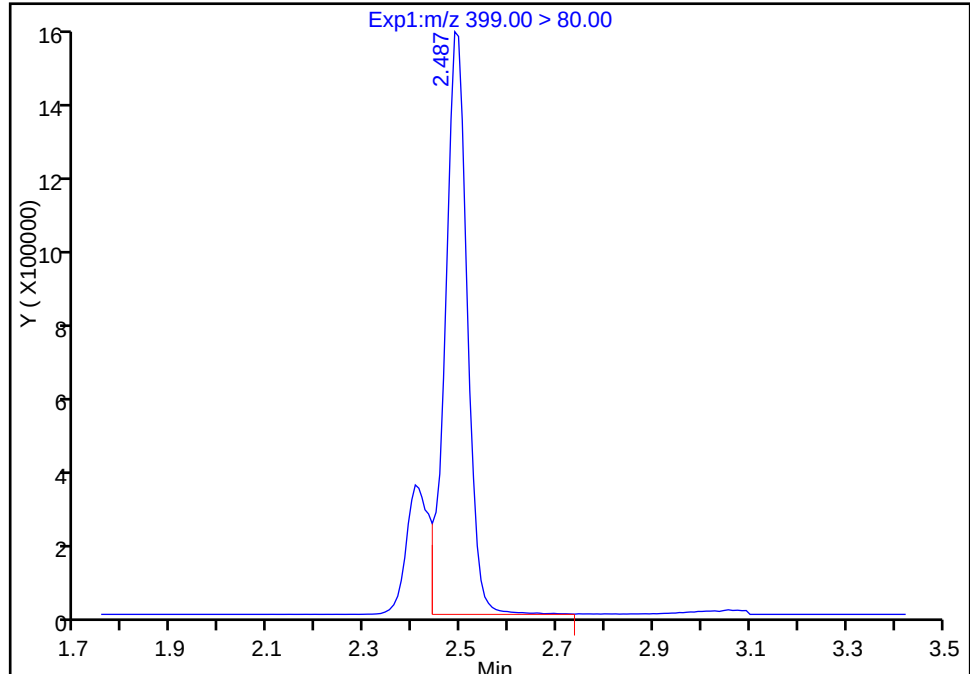
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_006.d  
Injection Date: 01-Mar-2017 11:31:20 Instrument ID: A8\_N  
Lims ID: IC L4 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 5  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

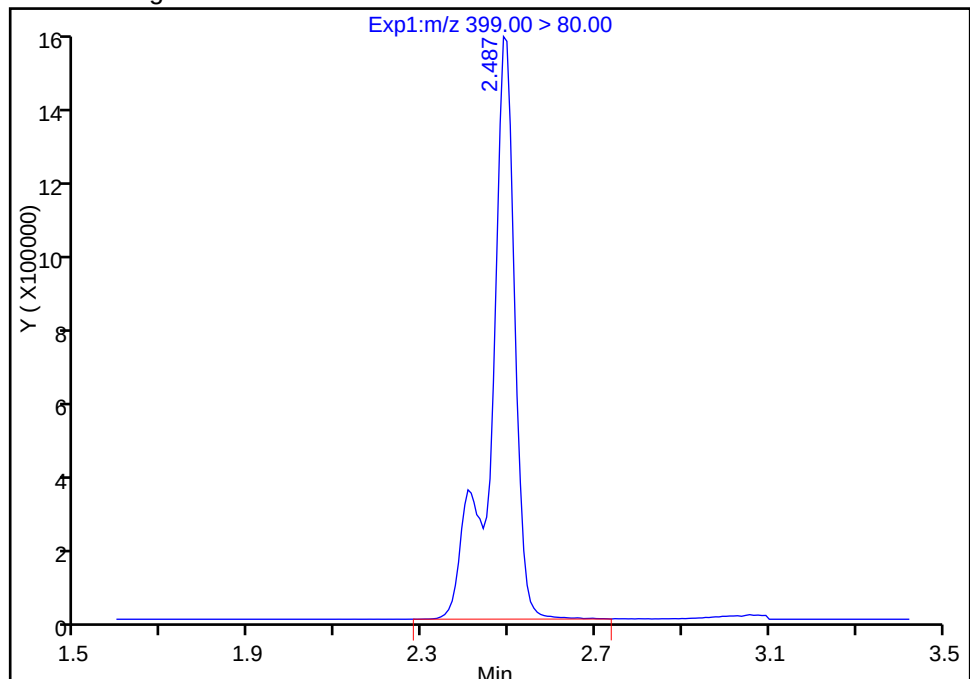
RT: 2.49  
Area: 4875110  
Amount: 17.771425  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.49  
Area: 5958886  
Amount: 17.225343  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:13

Audit Action: Manually Integrated

Audit Reason: Isomers

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_007.d  
 Lims ID: IC L5 Full  
 Client ID:  
 Sample Type: IC Calib Level: 5  
 Inject. Date: 01-Mar-2017 11:38:49 ALS Bottle#: 32 Worklist Smp#: 6  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L5-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 12:02:47

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.546 | 1.553  | -0.007 |        | 14941160 | 51.1         |                 | 102  | 667479 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                       | 1.554 | 1.558  | -0.004 | 1.000  | 13491384 | 53.3         |                 | 107  | 127406 |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.821 | 1.832  | -0.011 |        | 11440005 | 49.3         |                 | 98.5 | 626699 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.831 | 1.835  | -0.004 | 1.000  | 11520213 | 51.5         |                 | 103  | 120087 |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.871 | 1.872  | -0.001 | 1.000  | 19236596 | 45.5         |                 | 103  |        |       |
| 298.90 > 99.00                        | 1.871 | 1.872  | -0.001 | 1.000  | 8170789  |              | 2.35(0.00-0.00) | 103  |        |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                       | 2.127 | 2.133  | -0.006 | 1.000  | 9710439  | 50.9         |                 | 102  | 233505 |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.127 | 2.134  | -0.007 |        | 10719942 | 50.8         |                 | 102  | 387004 |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                       | 2.466 | 2.474  | -0.008 | 1.000  | 9559143  | 49.7         |                 | 99.4 | 84389  |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.466 | 2.475  | -0.009 |        | 9944069  | 51.5         |                 | 103  | 332028 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 399.00 > 80.00                        | 2.481 | 2.485  | -0.004 | 1.000  | 13776740 | 45.4         |                 | 99.8 |        | M     |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.481 | 2.489  | -0.008 |        | 13953506 | 48.0         |                 | 101  | 272613 |       |
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 429.00 > 409.00                       | 2.793 | 2.805  | -0.012 |        | 3650448  | 47.3         |                 | 99.6 |        |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.793 | 2.807  | -0.014 | 1.000  | 3256270  | 47.7         |                 | 101  |        |       |

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.824 | 2.835  | -0.011 | 1.000  | 10343315 | 50.5         |                 | 101  | 113108 |       |
| 413.00 > 169.00                       | 2.824 | 2.835  | -0.011 | 1.000  | 6136507  |              | 1.69(0.90-1.10) | 101  | 139975 |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.824 | 2.835  | -0.011 |        | 10019820 | 48.9         |                 | 97.8 | 414712 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.831 | 2.842  | -0.011 | 1.000  | 12919018 | 50.5         |                 | 106  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.087 | 3.145  | -0.058 | 1.000  | 11786011 | 48.3         |                 | 104  | 66281  |       |
| 499.00 > 99.00                        | 3.199 | 3.145  | 0.054  | 1.037  | 2666087  |              | 4.42(0.90-1.10) | 104  | 7715   |       |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.191 | 3.202  | -0.011 | 1.000  | 8361339  | 51.7         |                 | 103  | 164244 |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.199 | 3.204  | -0.005 |        | 11866933 | 49.1         |                 | 103  | 197438 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.199 | 3.208  | -0.009 |        | 8936977  | 50.2         |                 | 100  | 263744 |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.535 | 3.545  | -0.010 |        | 4360731  | 47.1         |                 | 98.3 |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.543 | 3.546  | -0.003 | 1.002  | 4074481  | 48.4         |                 | 101  |        |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.560 | 3.559  | 0.001  |        | 18558718 | 50.6         |                 | 101  | 247034 |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.552 | 3.560  | -0.008 | 1.000  | 7779706  | 53.2         |                 | 106  | 168568 |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.552 | 3.560  | -0.008 |        | 8074243  | 48.4         |                 | 96.9 | 187283 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.560 | 3.561  | -0.001 | 1.000  | 17500489 | 52.5         |                 | 105  | 422956 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.702 | 3.710  | -0.008 |        | 4409894  | 51.8         |                 | 104  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.702 | 3.713  | -0.011 | 1.000  | 4062831  | 47.4         |                 | 94.9 |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.859 | 3.866  | -0.007 | 1.000  | 7386234  | 49.9         |                 | 104  |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.867 | 3.875  | -0.008 |        | 4108227  | 50.5         |                 | 101  |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.867 | 3.876  | -0.009 |        | 6419845  | 49.1         |                 | 98.2 | 215302 | M     |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.867 | 3.878  | -0.011 | 1.000  | 6388091  | 49.1         |                 | 98.2 | 145481 |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.876 | 3.883  | -0.007 | 1.002  | 3565748  | 47.7         |                 | 95.3 |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.048 | 4.050  | -0.002 |        | 4549448  | 51.7         |                 | 103  |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.058 | 4.057  | 0.001  | 1.000  | 4038740  | 47.4         |                 | 94.9 |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.157 | 4.162  | -0.005 | 1.000  | 5939325  | 52.7         |                 | 105  | 93610  |       |



| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.157 | 4.164     | -0.007    |           | 6158791  | 49.7            |                 | 99.4 | 157158 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.241 | 4.235     | 0.006     |           | 4384481  | 51.4            |                 | 103  |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.241 | 4.242     | -0.001    | 1.000     | 4076562  | 47.3            |                 | 94.5 |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.418 | 4.424     | -0.006    | 1.000     | 5662375  | 52.6            |                 | 105  | 111159 |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.641 | 4.655     | -0.014    |           | 13257413 | 51.2            |                 | 102  | 430727 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.651 | 4.657     | -0.006    | 1.000     | 12631200 | 52.1            |                 | 104  | 118223 |       |
| 713.00 > 169.00                       | 4.651 | 4.657     | -0.006    | 1.000     | 1664503  |                 | 7.59(0.00-0.00) | 104  | 123601 |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.049 | 5.057     | -0.008    |           | 6606731  | 52.8            |                 | 106  | 93567  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.049 | 5.059     | -0.010    | 1.000     | 5695645  | 49.5            |                 | 99.0 | 5357   |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.383 | 5.399     | -0.016    | 1.000     | 4591929  | 52.0            |                 | 104  | 6139   |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L5\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_007.d

Injection Date: 01-Mar-2017 11:38:49

Instrument ID: A8\_N

Lims ID: IC L5 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 32

Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

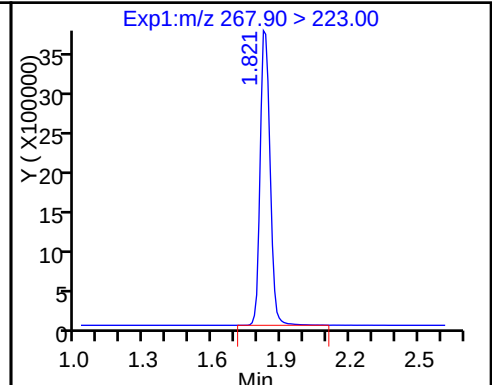
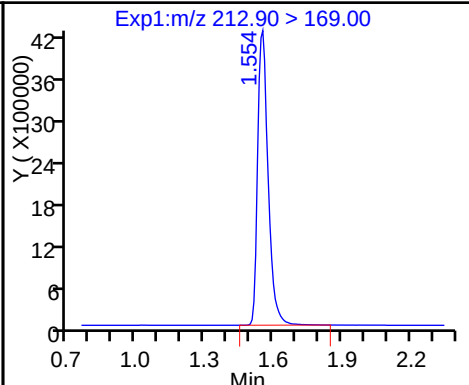
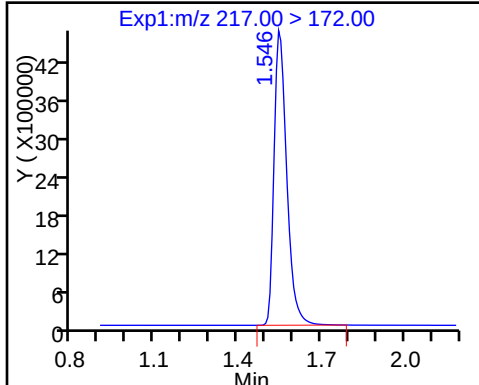
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

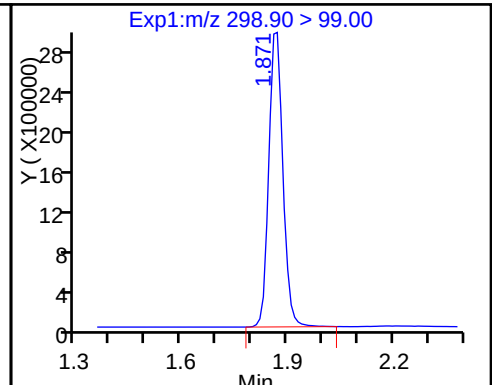
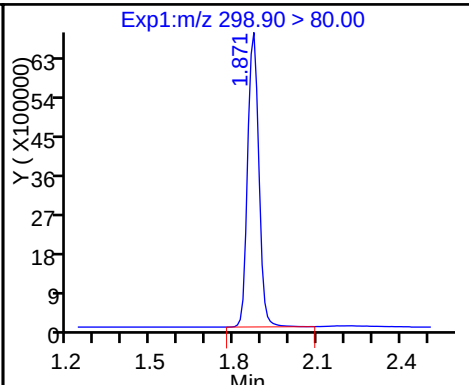
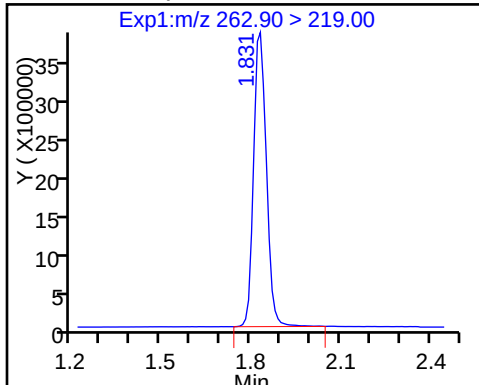
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

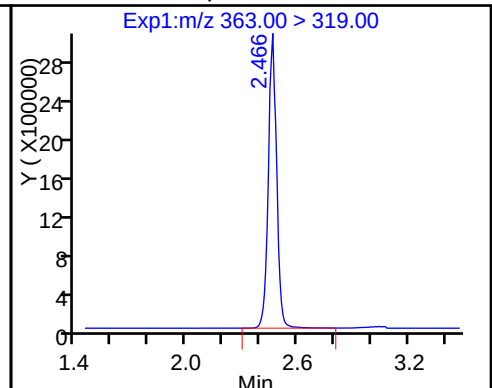
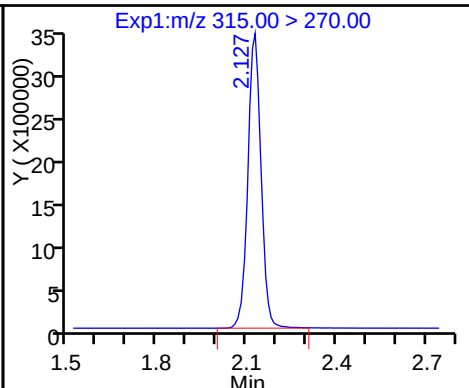
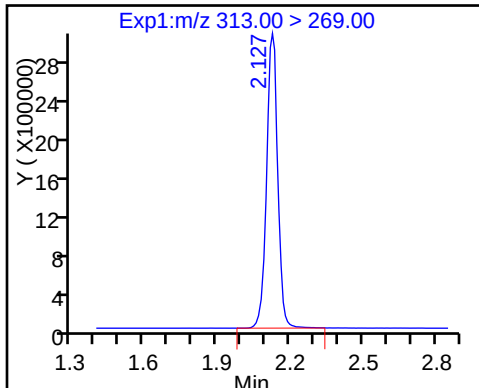
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

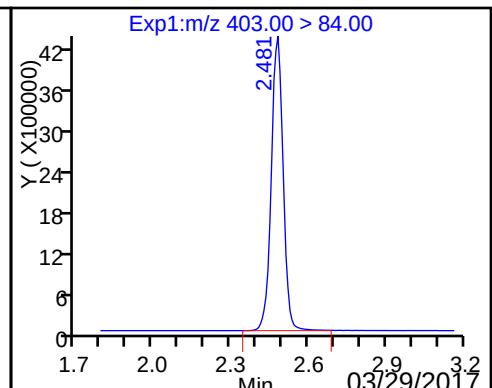
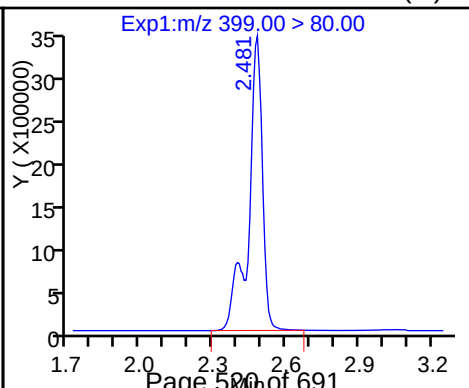
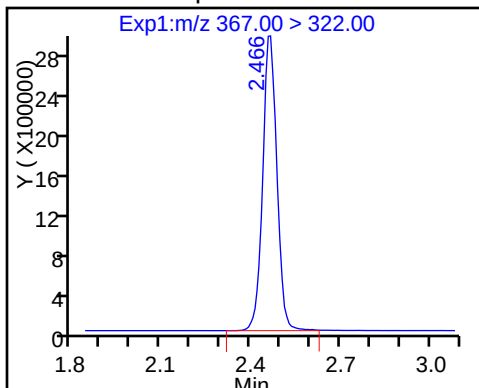
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

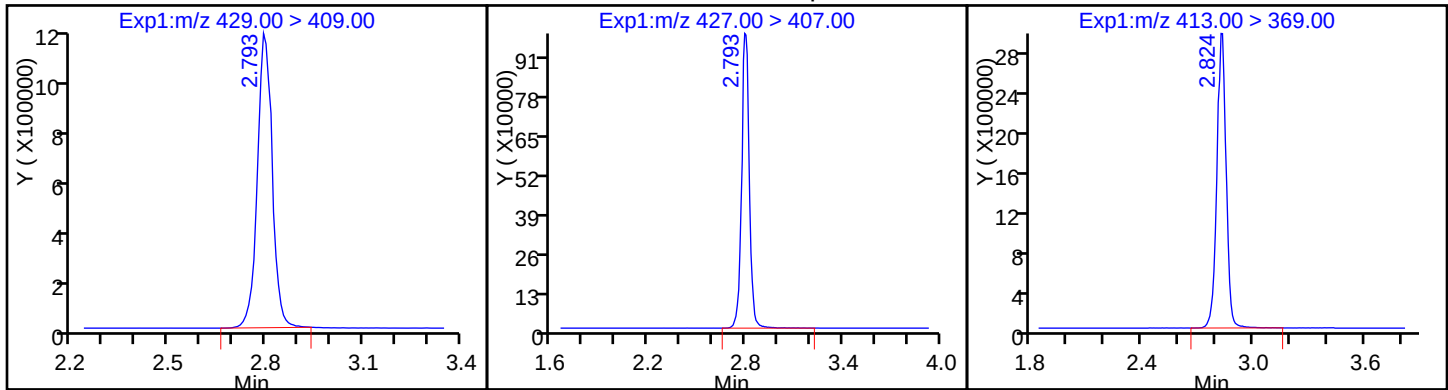
8 Perfluorohexanesulfonic acid (M)

D 11 18O2 PFHxS



D 12 M2-6:2FTS

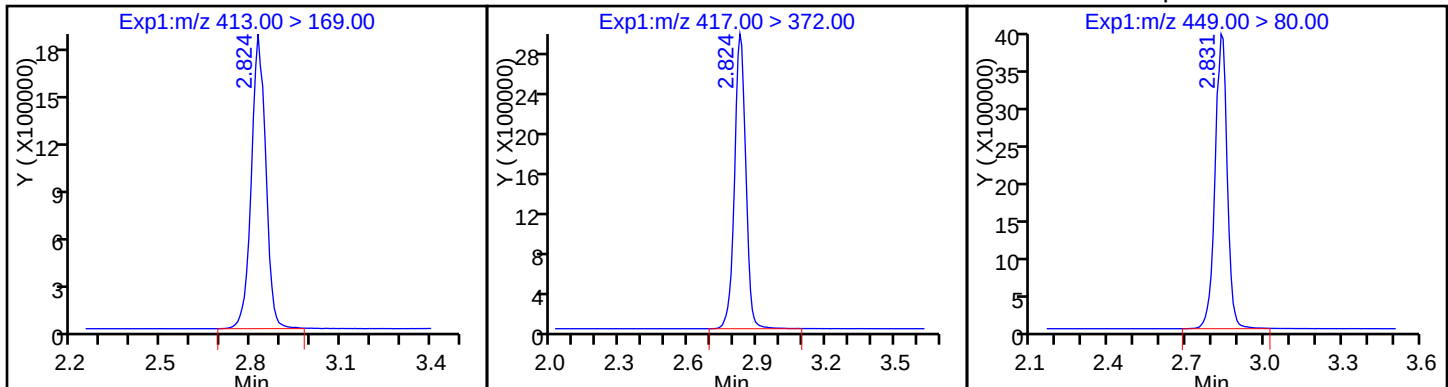
13 Sodium 1H,1H,2H,2H-perfluorooctan-1-ol 15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

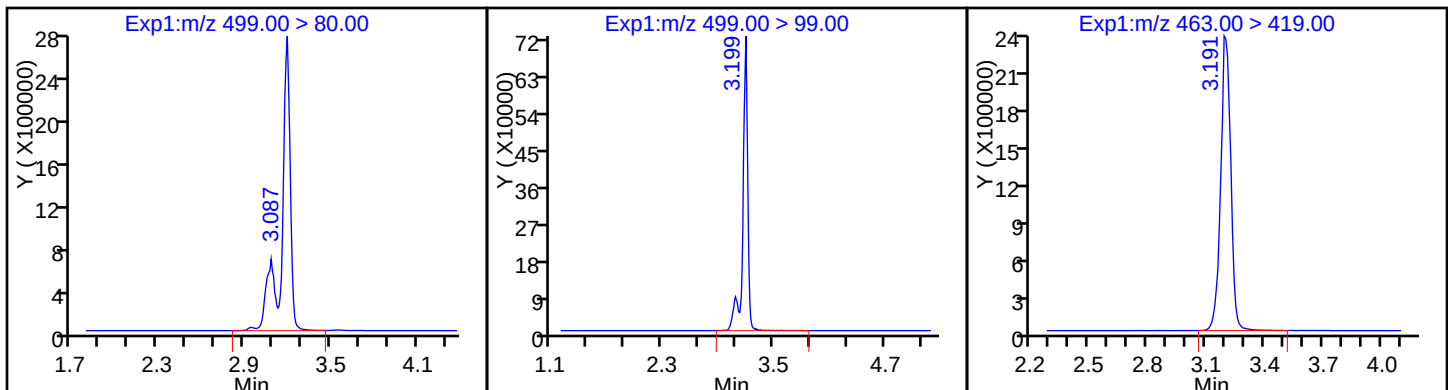
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

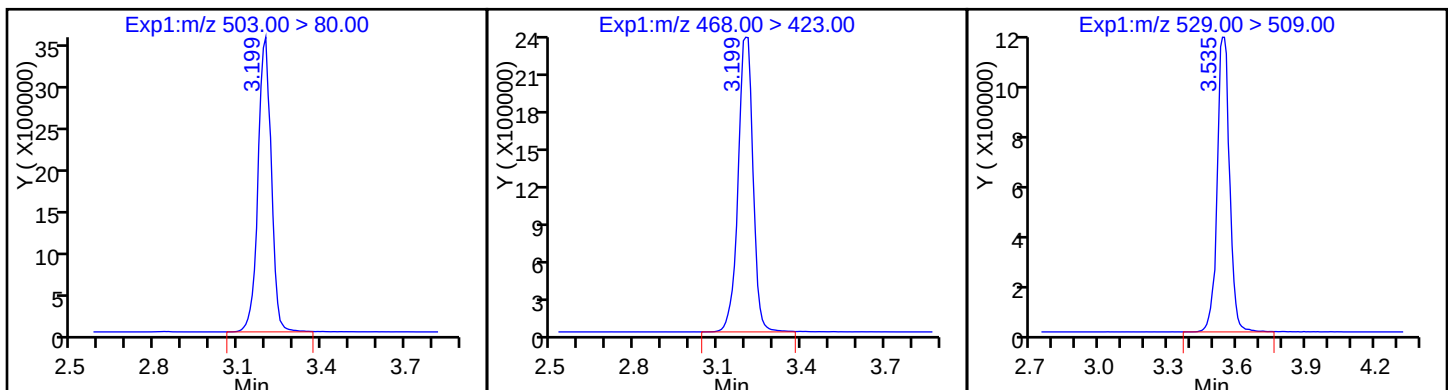
20 Perfluorononanoic acid



D 18 13C4 PFOS

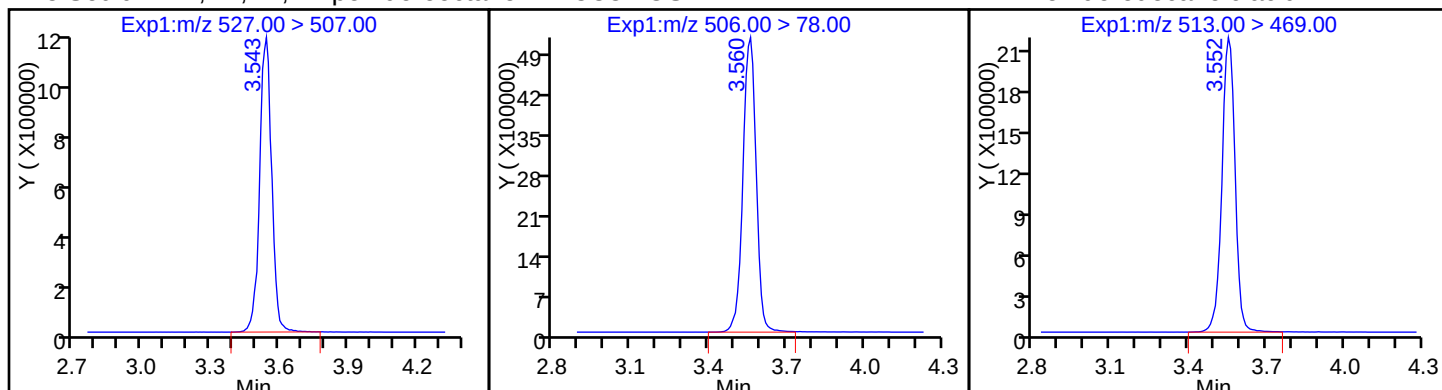
D 19 13C5 PFNA

D 26 M2-8:2FTS



## 25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

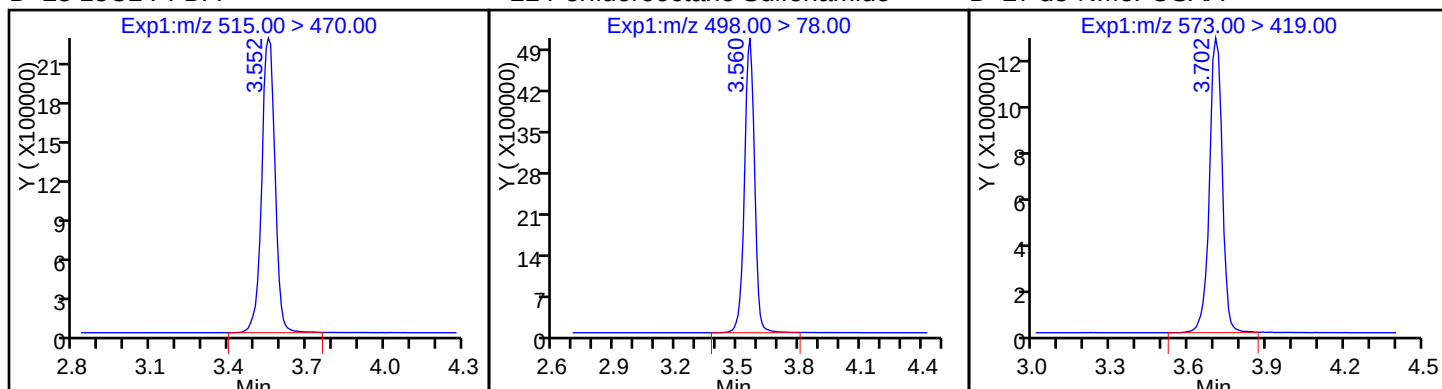
## 24 Perfluorodecanoic acid



## D 23 13C2 PFDA

## 22 Perfluorooctane Sulfonamide

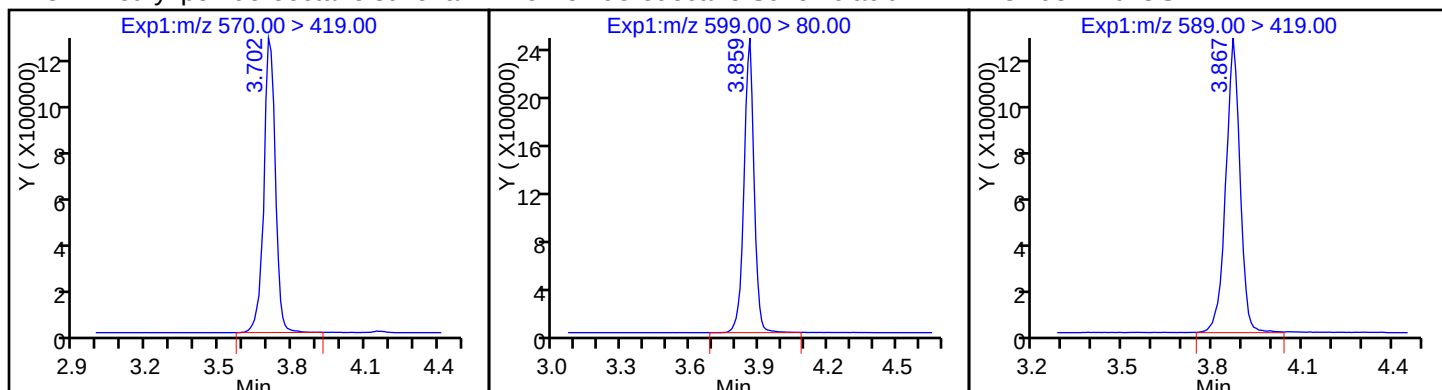
## D 27 d3-NMeFOSAA



## 28 N-methyl perfluorooctane sulfonami

## 29 Perfluorodecane Sulfonic acid

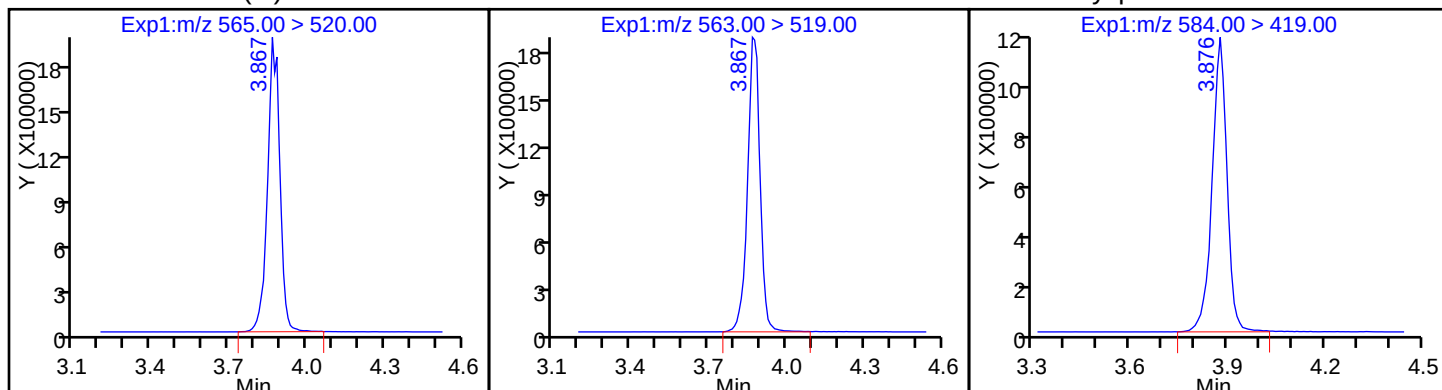
## D 32 d5-NEtFOSAA



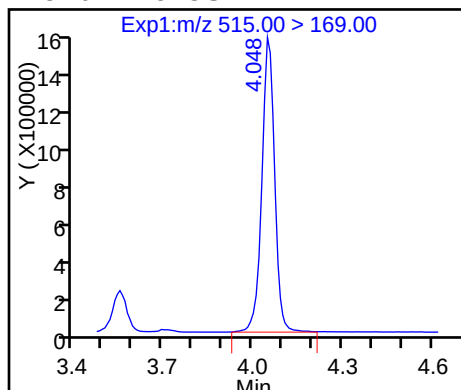
## D 30 13C2 PFUnA (M)

## 31 Perfluoroundecanoic acid

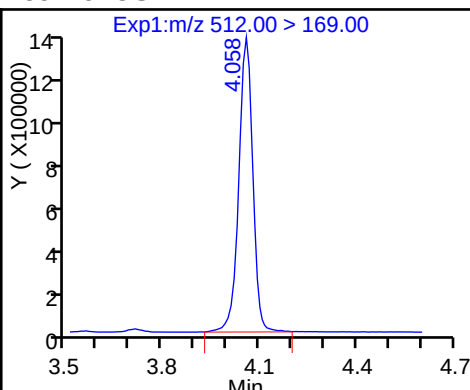
## 33 N-ethyl perfluorooctane sulfonamid



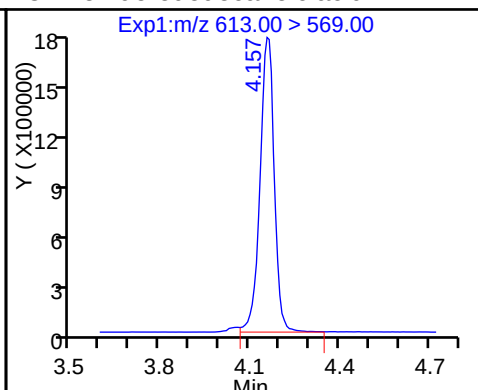
D 34 d-N-MeFOSA-M



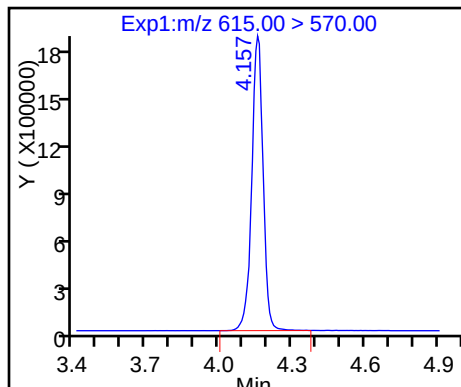
35 MeFOSA



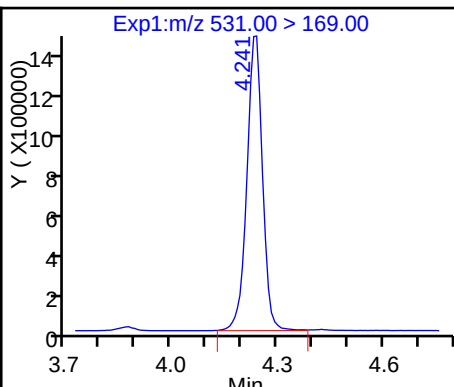
37 Perfluorododecanoic acid



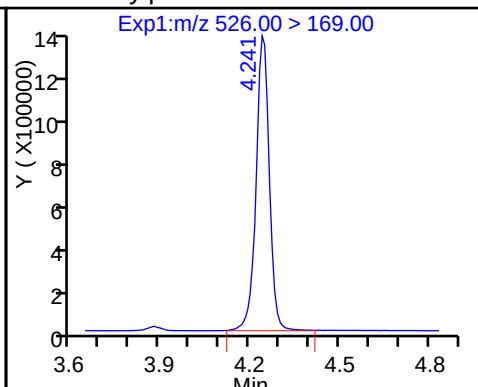
D 36 13C2 PFDaA



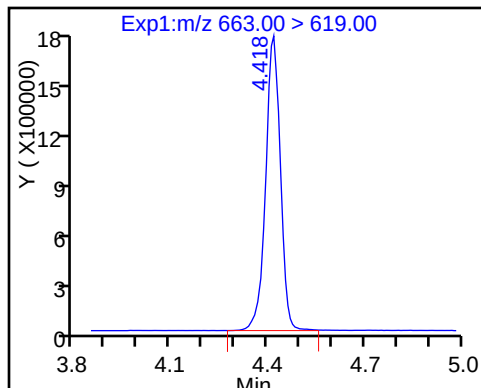
D 38 d-N-EtFOSA-M



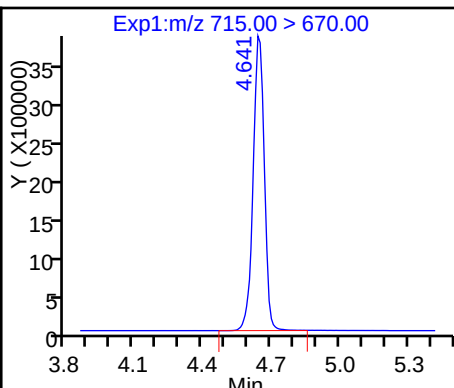
39 N-ethylperfluoro-1-octanesulfonami



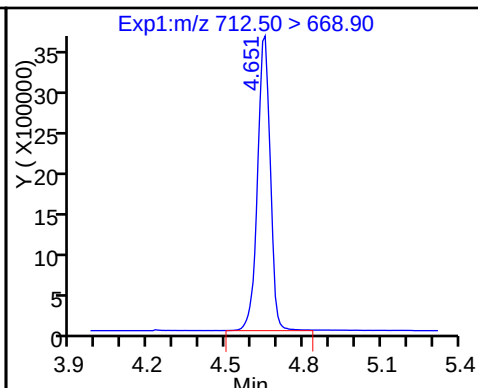
41 Perfluorotridecanoic acid



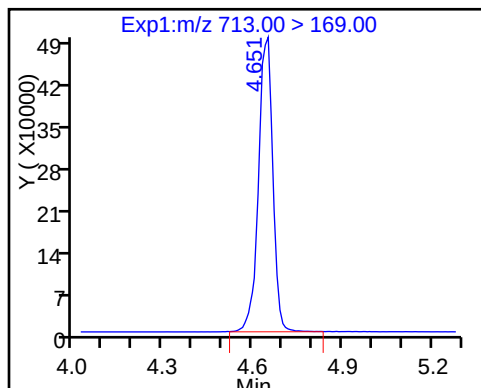
D 43 13C2-PFTeDA



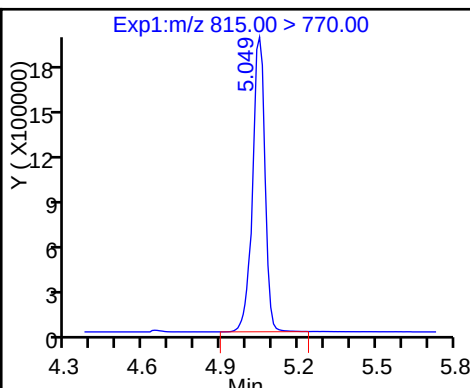
42 Perfluorotetradecanoic acid



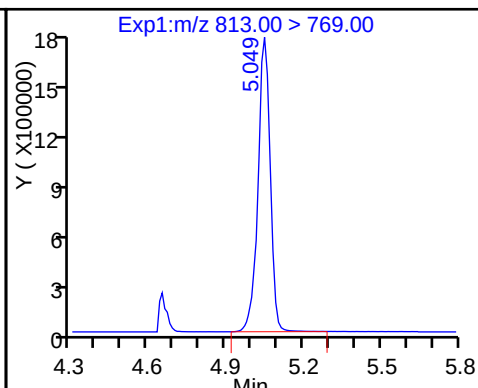
42 Perfluorotetradecanoic acid



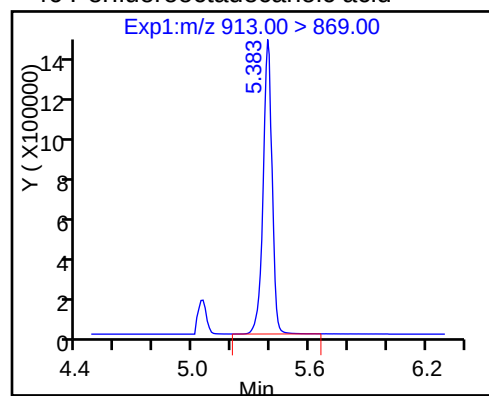
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

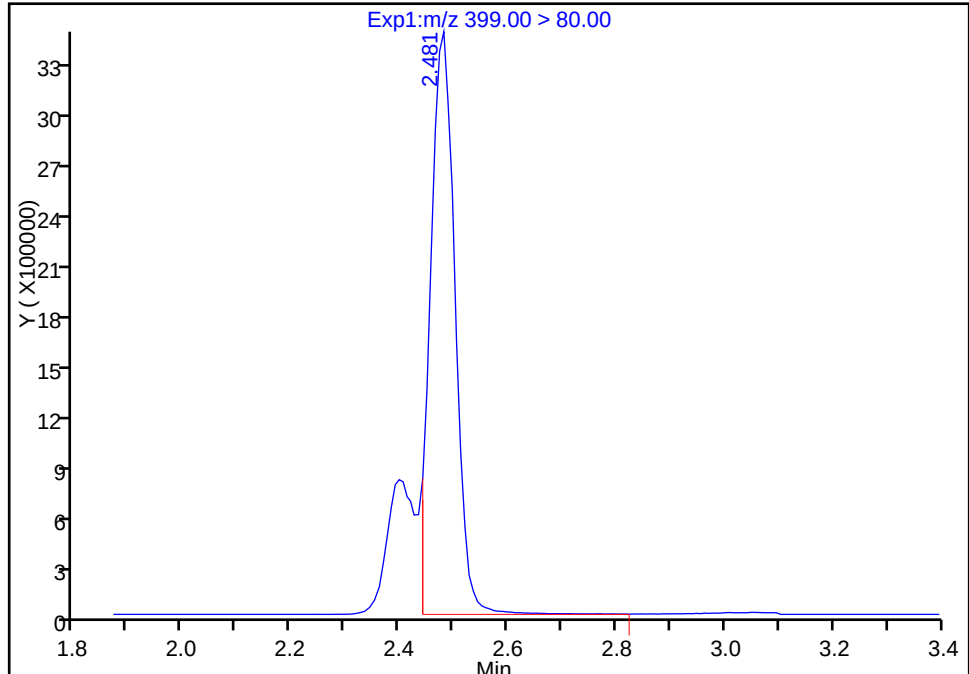
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_007.d  
Injection Date: 01-Mar-2017 11:38:49 Instrument ID: A8\_N  
Lims ID: IC L5 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 6  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

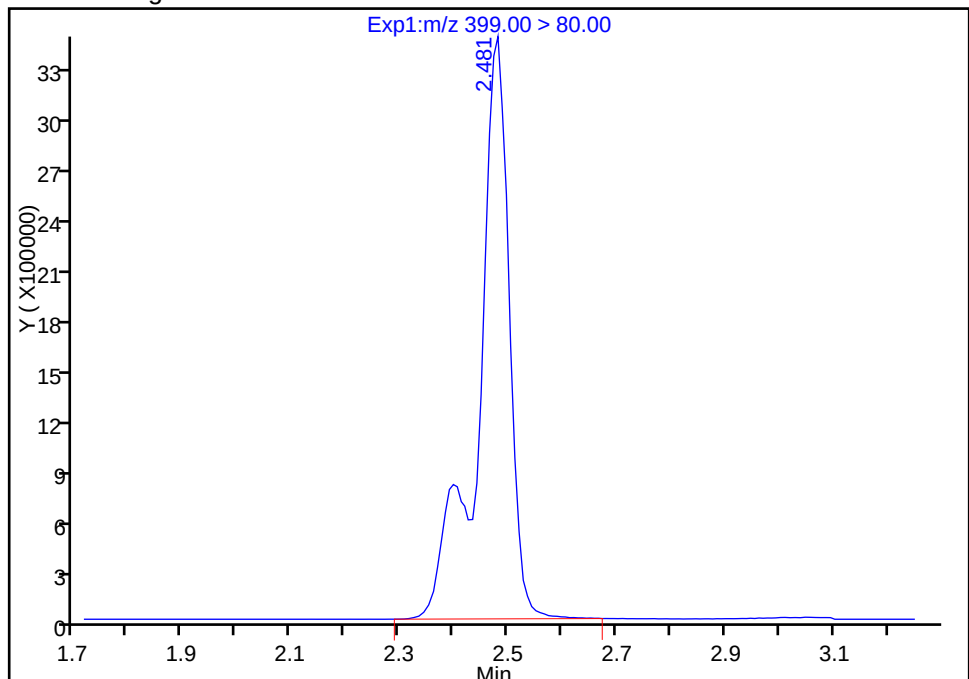
RT: 2.48  
Area: 10754320  
Amount: 35.081839  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.48  
Area: 13776740  
Amount: 45.409199  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:15

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_007.d

Injection Date: 01-Mar-2017 11:38:49

Instrument ID: A8\_N

Lims ID: IC L5 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 32 Worklist Smp#: 6

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

Column:

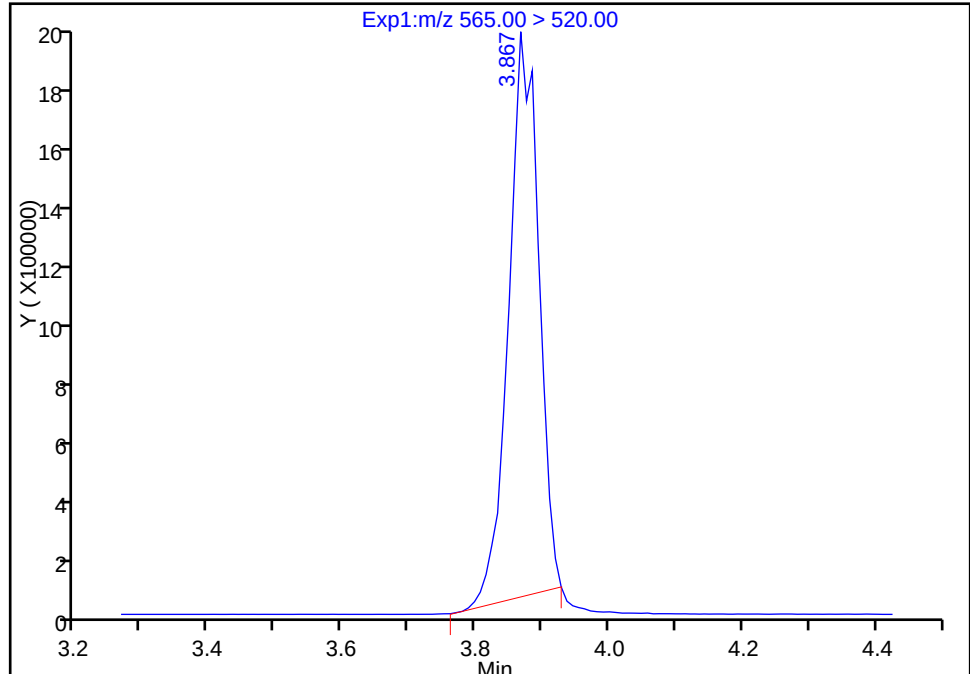
Detector EXP1

**D 30 13C2 PFUnA, CAS: STL00997**

Signal: 1

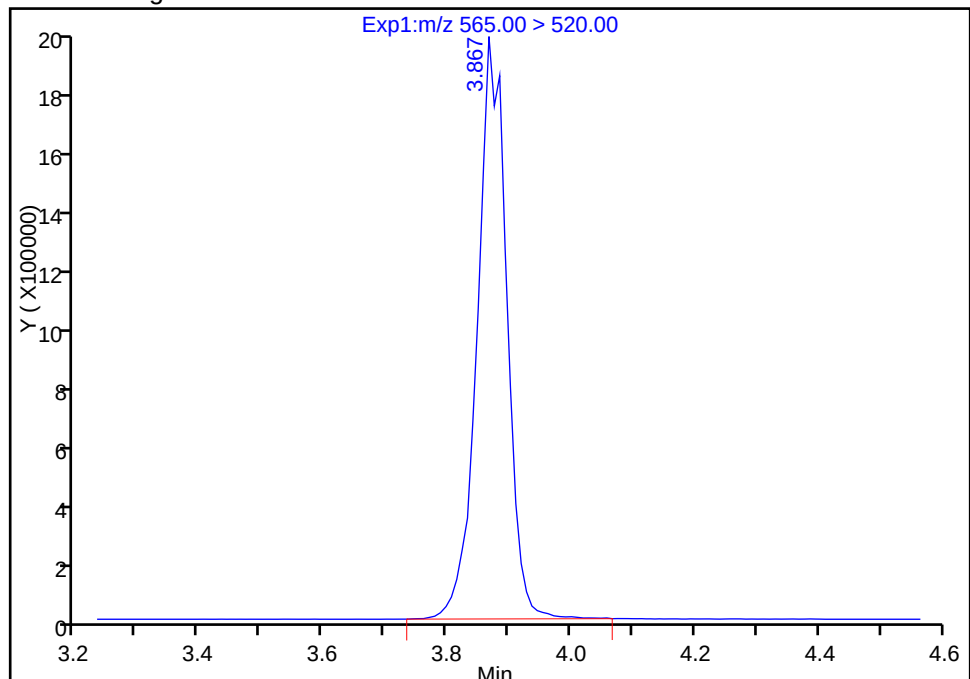
RT: 3.87  
Area: 5863845  
Amount: 45.473087  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.87  
Area: 6419845  
Amount: 49.079386  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:15

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d  
 Lims ID: IC L6 Full  
 Client ID:  
 Sample Type: IC Calib Level: 6  
 Inject. Date: 01-Mar-2017 11:46:18 ALS Bottle#: 33 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: L6-FULL  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub15  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:18 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 12:04:21

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.546 | 1.553  | -0.007 |        | 12268568 | 42.0         |                 | 84.0 | 717990 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                       | 1.554 | 1.558  | -0.004 | 1.000  | 37767596 | 181.7        |                 | 90.8 | 312656 |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.822 | 1.832  | -0.010 |        | 9320645  | 40.1         |                 | 80.3 | 792870 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.822 | 1.835  | -0.013 | 1.000  | 31900088 | 174.9        |                 | 87.4 | 249960 |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.861 | 1.872  | -0.011 | 1.000  | 47824719 | 141.7        |                 | 80.1 |        |       |
| 298.90 > 99.00                        | 1.861 | 1.872  | -0.011 | 1.000  | 24392241 |              | 1.96(0.00-0.00) | 80.1 |        |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                       | 2.122 | 2.133  | -0.011 | 1.000  | 30367858 | 188.7        |                 | 94.4 | 703737 |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.122 | 2.134  | -0.012 |        | 9044966  | 42.9         |                 | 85.8 | 272049 |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                       | 2.461 | 2.474  | -0.013 | 1.000  | 28382869 | 191.6        |                 | 95.8 | 225664 |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.461 | 2.475  | -0.014 |        | 7657909  | 39.7         |                 | 79.4 | 207490 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 399.00 > 80.00                        | 2.478 | 2.485  | -0.007 | 1.000  | 42133990 | 173.8        |                 | 95.5 |        |       |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.478 | 2.489  | -0.011 |        | 11147782 | 38.3         |                 | 81.0 | 329095 |       |
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 429.00 > 409.00                       | 2.789 | 2.805  | -0.016 |        | 3409307  | 44.2         |                 | 93.0 |        |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.797 | 2.807  | -0.010 | 1.000  | 11262289 | 177.0        |                 | 93.3 |        |       |

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.820 | 2.835  | -0.015 |        | 7688496  | 37.5         |                 | 75.0 | 192123 |       |
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.820 | 2.835  | -0.015 | 1.000  | 29743583 | 189.3        |                 | 94.7 | 342015 |       |
| 413.00 > 169.00                       | 2.813 | 2.835  | -0.022 | 0.997  | 18781119 |              | 1.58(0.90-1.10) | 94.7 | 380819 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.828 | 2.842  | -0.014 | 1.000  | 36282267 | 168.5        |                 | 88.5 |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.186 | 3.145  | 0.041  | 1.000  | 39756569 | 193.5        |                 | 104  | 230631 | M     |
| 499.00 > 99.00                        | 3.195 | 3.145  | 0.050  | 1.003  | 9596909  |              | 4.14(0.90-1.10) | 104  | 294050 | M     |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.186 | 3.202  | -0.016 | 1.000  | 26057481 | 206.4        |                 | 103  | 338058 |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.186 | 3.204  | -0.018 |        | 9985826  | 41.3         |                 | 86.5 | 102426 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.195 | 3.208  | -0.013 |        | 6983620  | 39.3         |                 | 78.5 | 207659 |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.523 | 3.545  | -0.022 |        | 3659550  | 39.5         |                 | 82.5 |        | M     |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.523 | 3.546  | -0.023 | 1.000  | 12220206 | 173.0        |                 | 90.3 |        | M     |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.548 | 3.559  | -0.011 |        | 15188110 | 41.4         |                 | 82.8 | 281288 |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.548 | 3.560  | -0.012 |        | 6226569  | 37.4         |                 | 74.7 | 124238 |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.548 | 3.560  | -0.012 | 1.000  | 24265114 | 215.2        |                 | 108  | 364832 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.557 | 3.561  | -0.004 | 1.000  | 47690261 | 174.7        |                 | 87.4 | 485165 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.696 | 3.710  | -0.014 |        | 4115011  | 48.3         |                 | 96.6 |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.707 | 3.713  | -0.006 | 1.003  | 16290792 | 203.8        |                 | 102  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.853 | 3.866  | -0.013 | 1.000  | 24675284 | 198.3        |                 | 103  |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.862 | 3.875  | -0.013 |        | 3122900  | 38.4         |                 | 76.8 |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.862 | 3.876  | -0.014 |        | 4771549  | 36.5         |                 | 73.0 | 166160 |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.862 | 3.878  | -0.016 | 1.000  | 18672321 | 193.0        |                 | 96.5 | 304259 |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.871 | 3.883  | -0.012 | 1.002  | 11906031 | 209.4        |                 | 105  |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.042 | 4.050  | -0.008 |        | 4433562  | 50.4         |                 | 101  |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.051 | 4.057  | -0.006 | 1.000  | 17219029 | 207.6        |                 | 104  |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.138 | 4.162  | -0.024 | 1.000  | 19408225 | 199.4        |                 | 99.7 | 329427 |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        | M     |
| 615.00 > 570.00                       | 4.152 | 4.164     | -0.012    |           | 5320903  | 42.9            |                 | 85.9 | 133785 | M     |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.227 | 4.235     | -0.008    |           | 4425922  | 51.9            |                 | 104  |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.236 | 4.242     | -0.006    | 1.000     | 17404238 | 199.9           |                 | 99.9 |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.407 | 4.424     | -0.017    | 1.000     | 18379771 | 197.7           |                 | 98.9 | 284610 |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.635 | 4.655     | -0.020    |           | 11353892 | 43.8            |                 | 87.6 | 278458 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.635 | 4.657     | -0.022    | 1.000     | 39468467 | 188.6           |                 | 94.3 | 283243 |       |
| 713.00 > 169.00                       | 4.635 | 4.657     | -0.022    | 1.000     | 6001611  |                 | 6.58(0.00-0.00) | 94.3 | 215597 |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.035 | 5.057     | -0.022    |           | 5879424  | 47.0            |                 | 94.0 | 81025  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.046 | 5.059     | -0.013    | 1.000     | 20137749 | 203.8           |                 | 102  | 23053  |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.375 | 5.399     | -0.024    | 1.000     | 17831844 | 233.5           |                 | 117  | 22435  |       |

**QC Flag Legend**

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L6\_00002

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d

Injection Date: 01-Mar-2017 11:46:18

Instrument ID: A8\_N

Lims ID: IC L6 Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 33

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

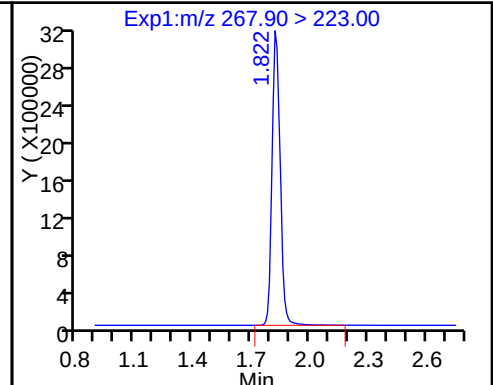
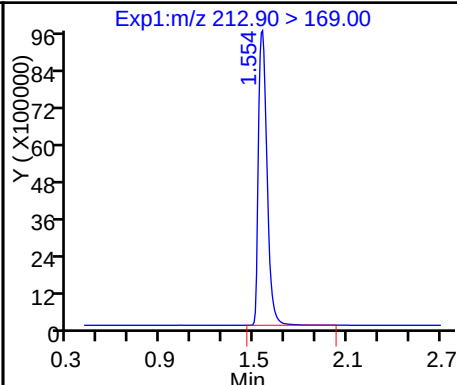
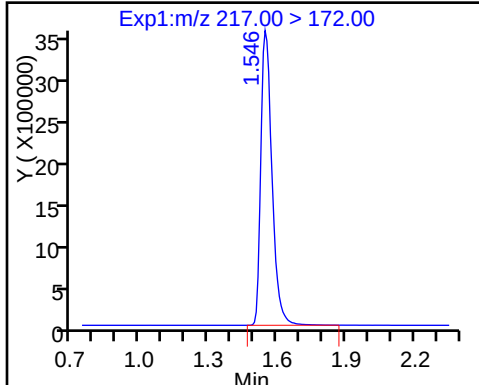
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

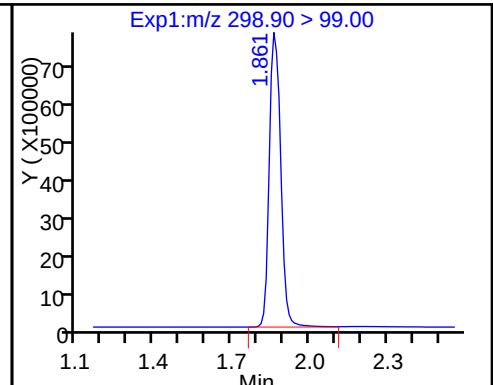
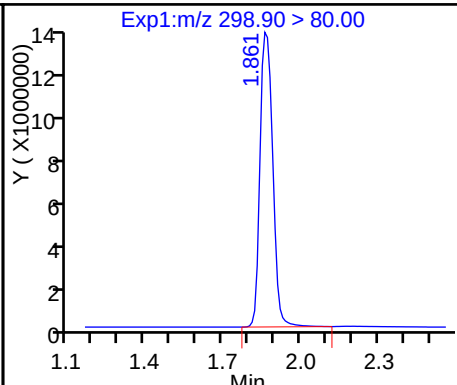
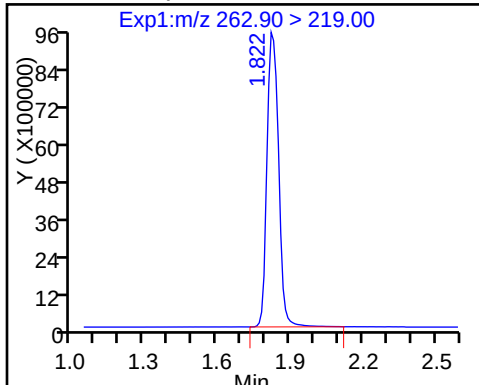
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

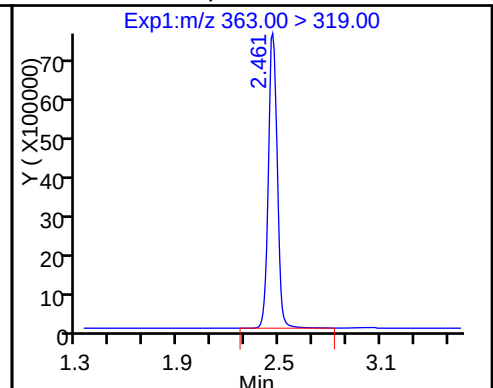
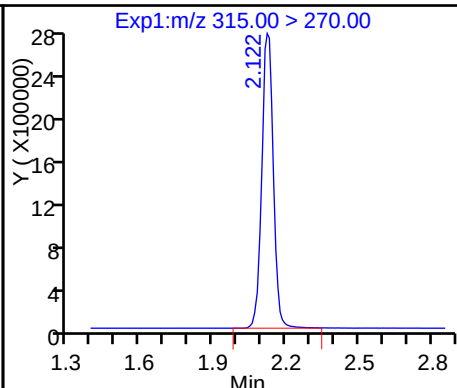
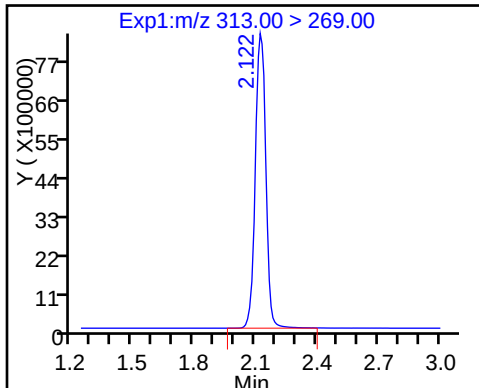
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

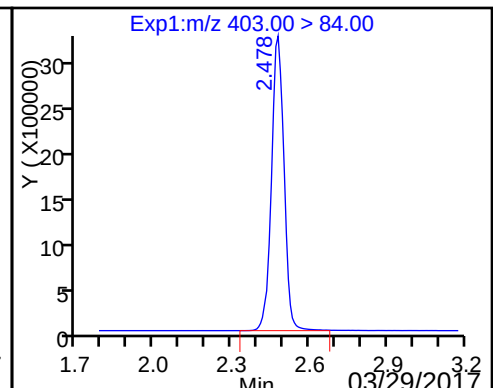
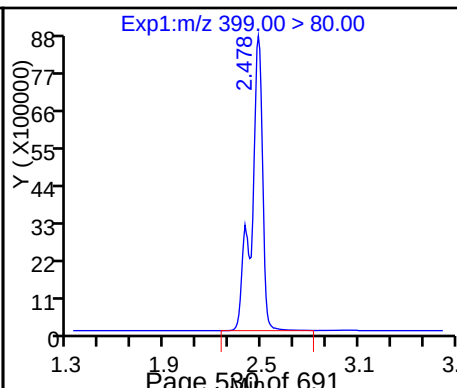
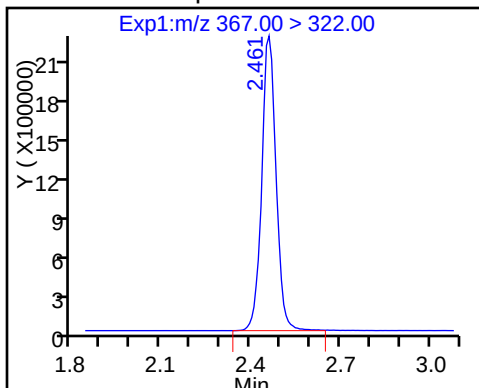
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid

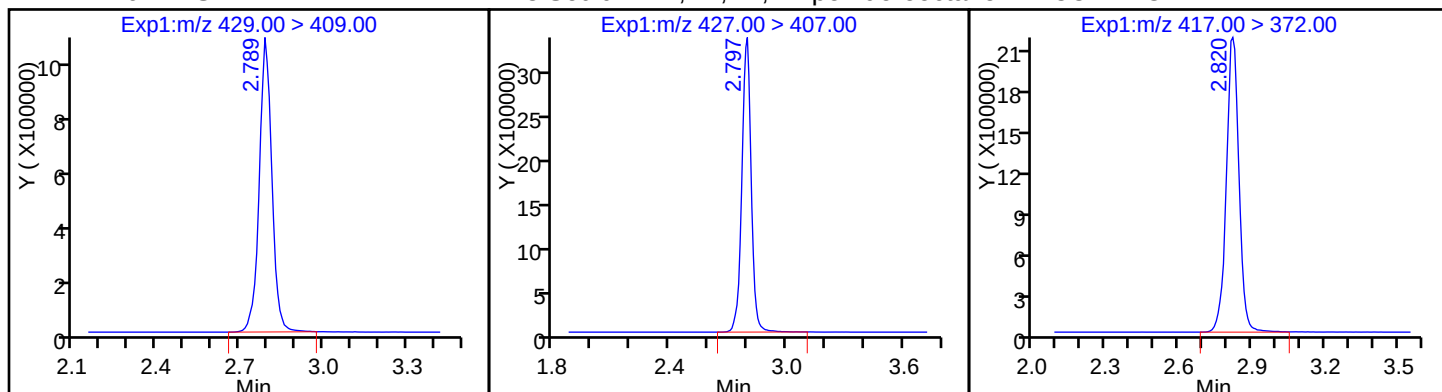
D 11 18O2 PFHxS



D 12 M2-6:2FTS

13 Sodium 1H,1H,2H,2H-perfluorooctadecanoate

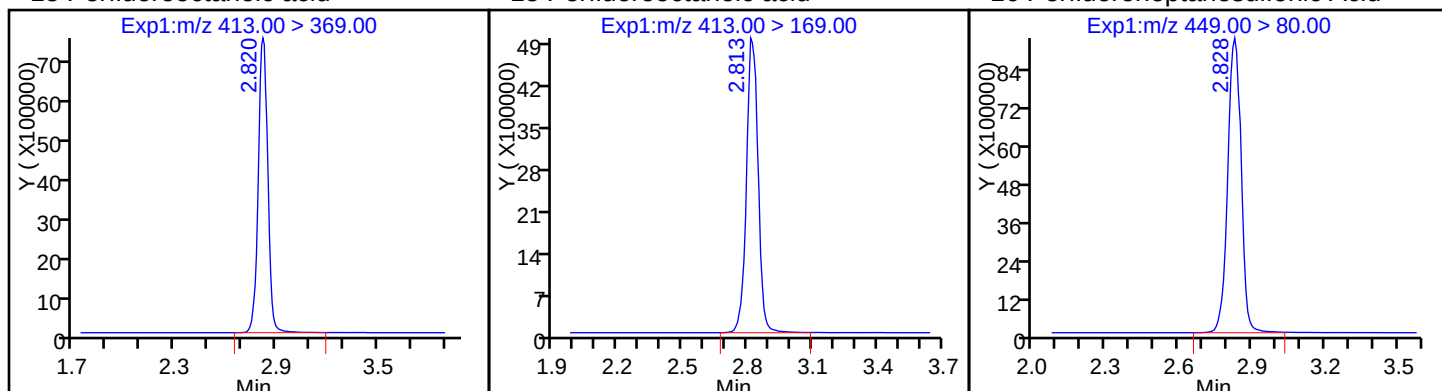
D 14 13C4 PFOA



15 Perfluorooctanoic acid

15 Perfluorooctanoic acid

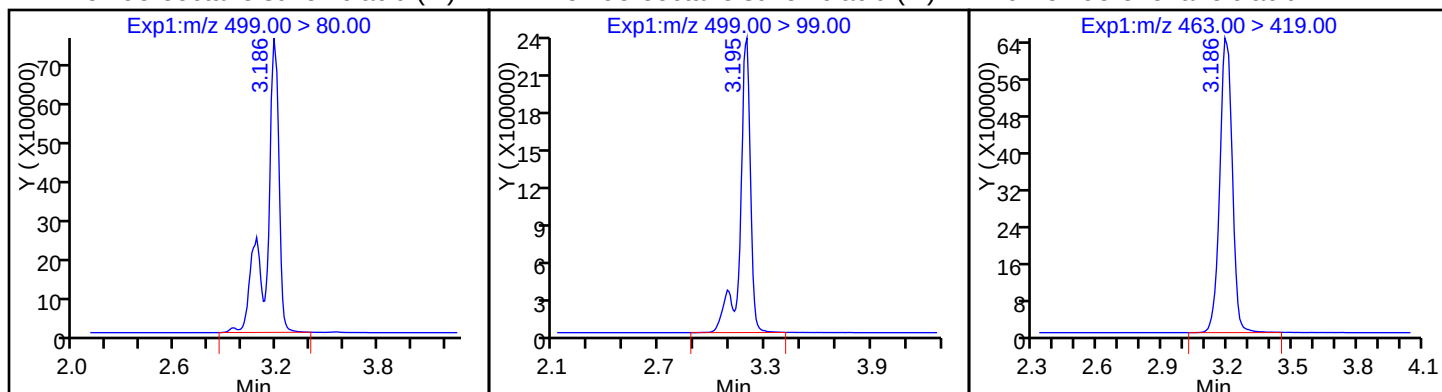
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid (M)

17 Perfluorooctane sulfonic acid (M)

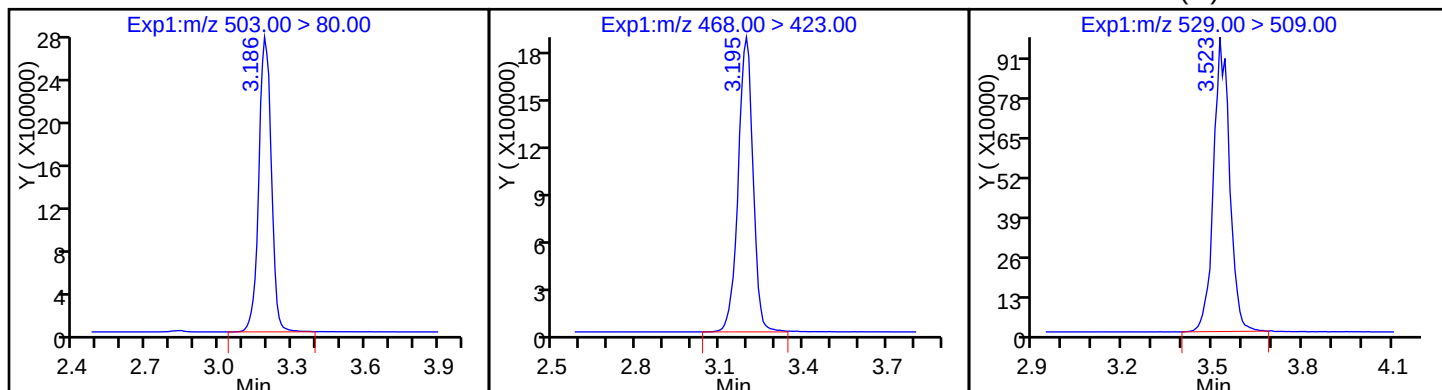
20 Perfluorononanoic acid



D 18 13C4 PFOS

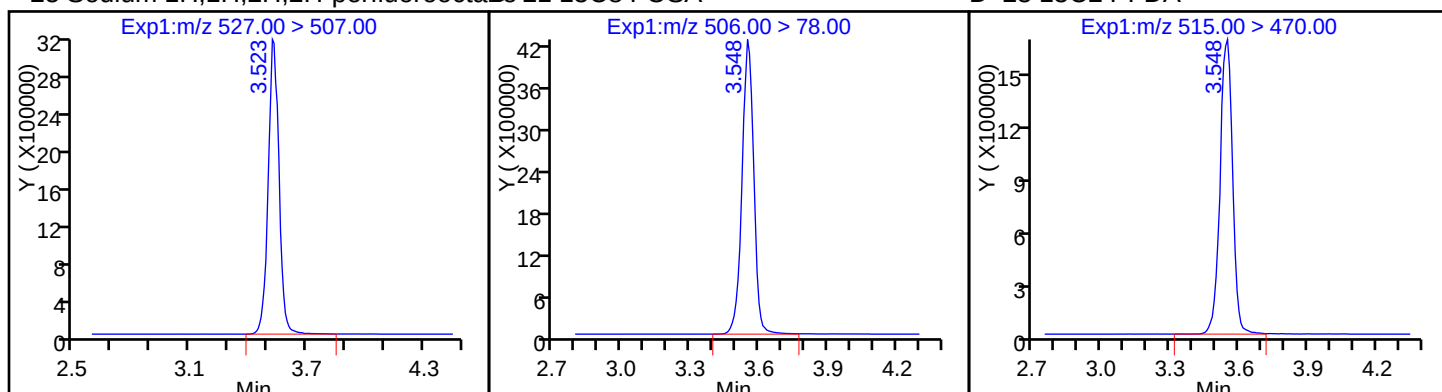
D 19 13C5 PFNA

D 26 M2-8:2FTS (M)



25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

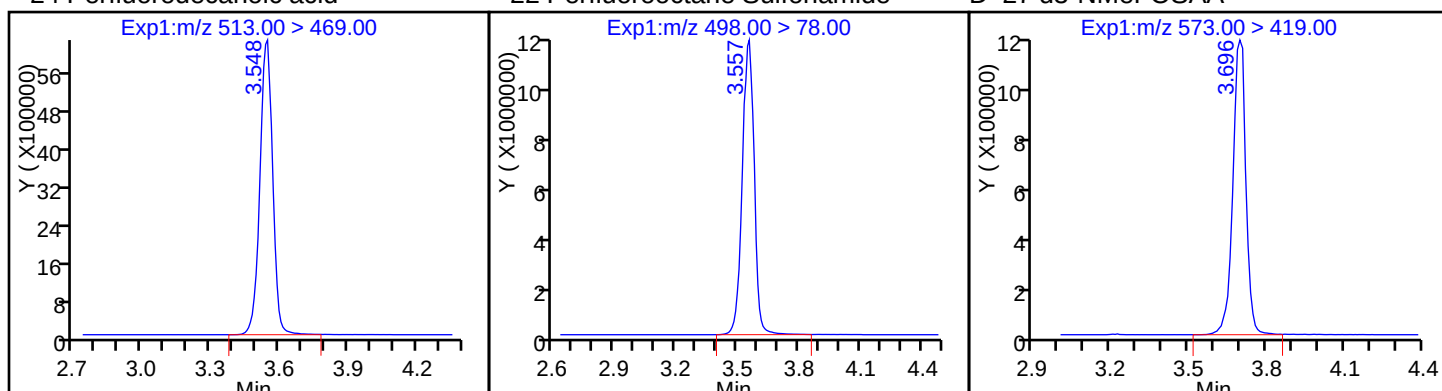
D 23 13C2 PFDA



24 Perfluorodecanoic acid

22 Perfluorooctane Sulfonamide

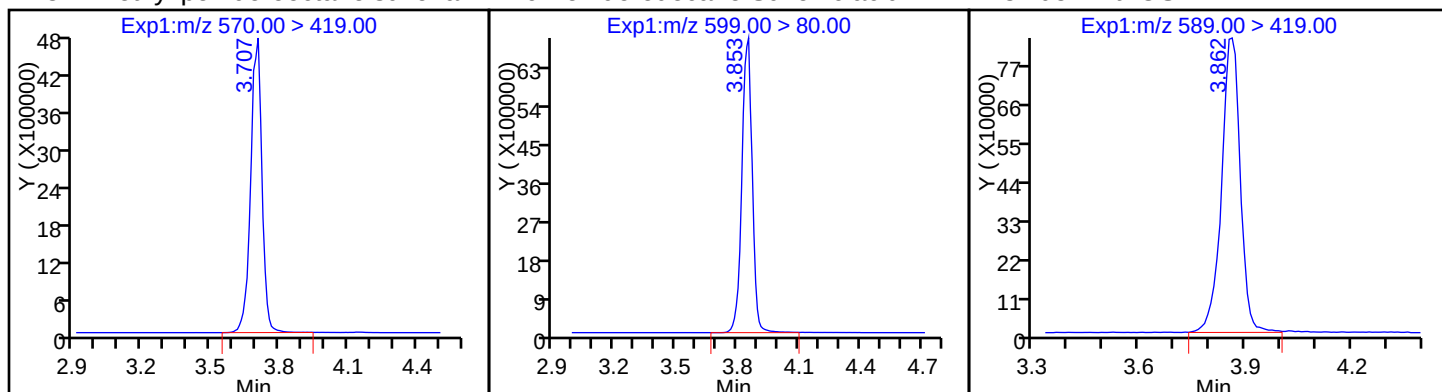
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

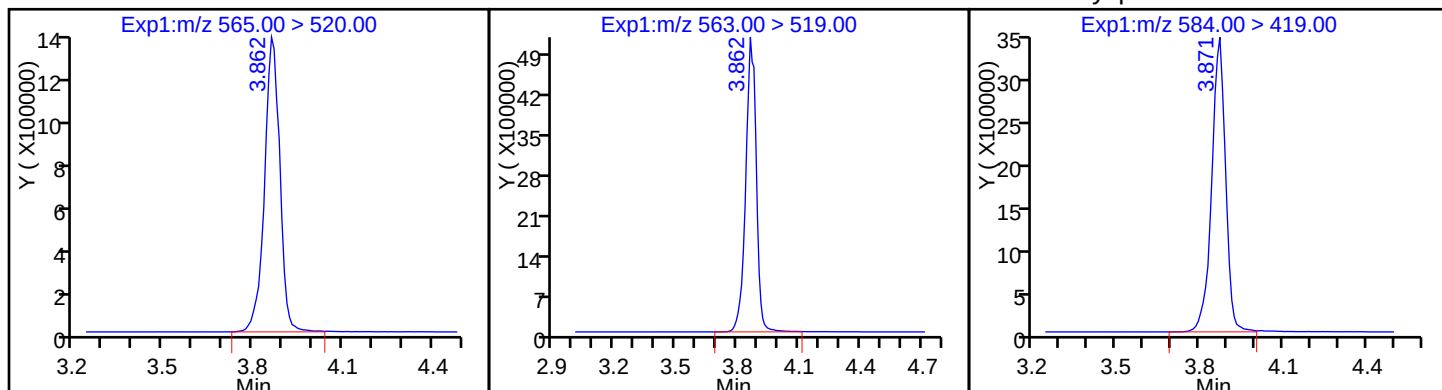
D 32 d5-NEtFOSAA



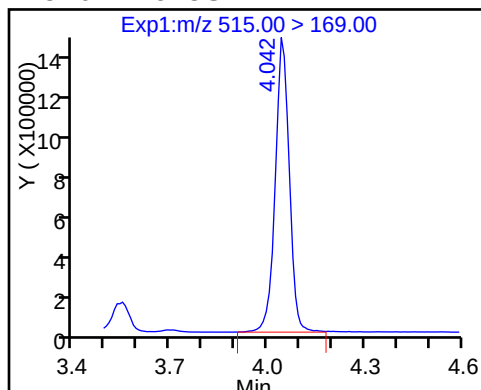
D 30 13C2 PFUnA

31 Perfluoroundecanoic acid

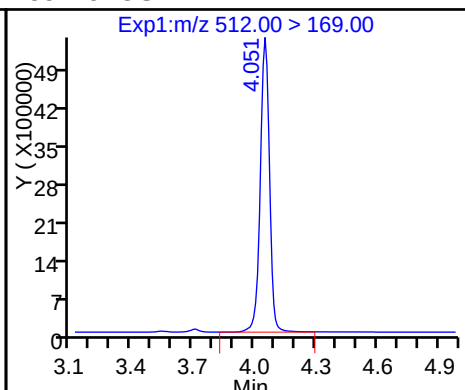
33 N-ethyl perfluorooctane sulfonamid



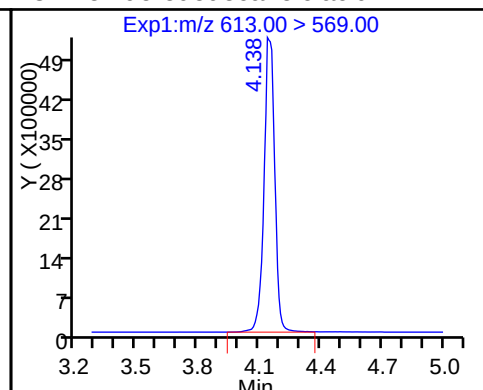
D 34 d-N-MeFOSA-M



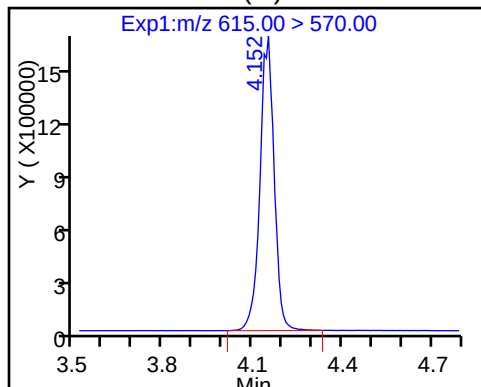
35 MeFOSA



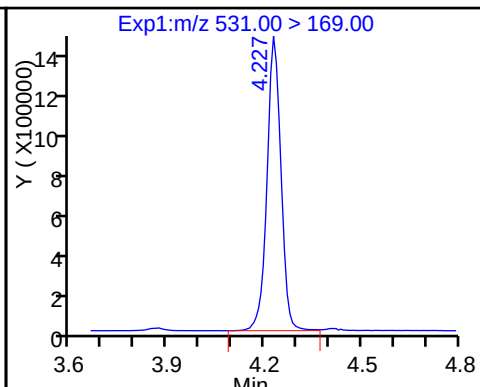
37 Perfluorododecanoic acid



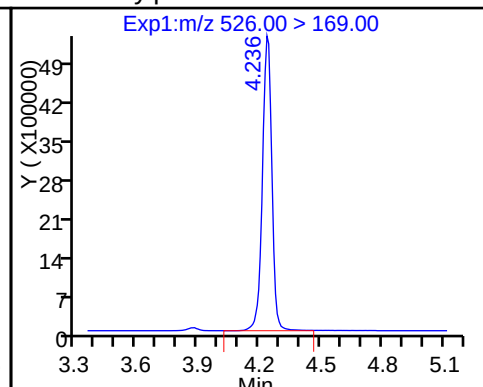
D 36 13C2 PFDa (M)



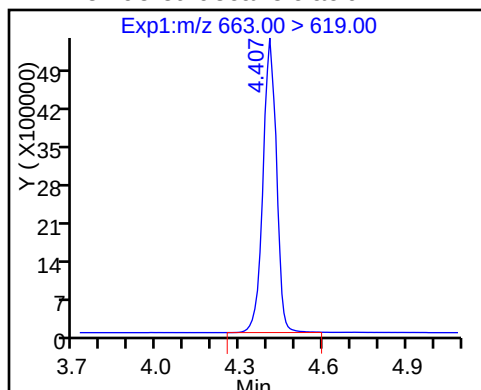
D 38 d-N-EtFOSA-M



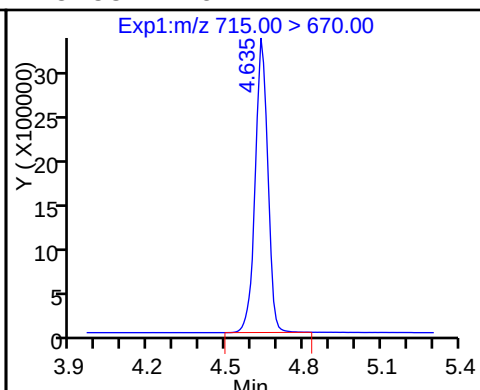
39 N-ethylperfluoro-1-octanesulfonami



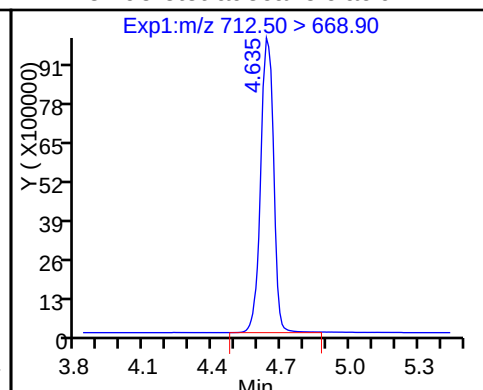
41 Perfluorotridecanoic acid



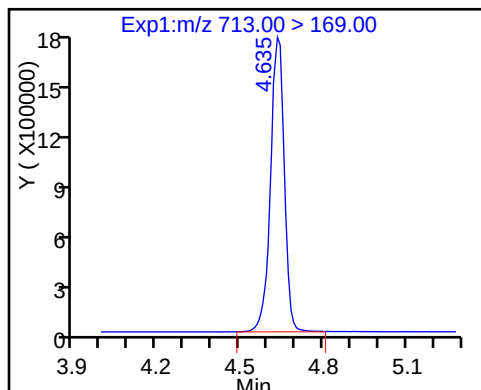
D 43 13C2-PFTeDA



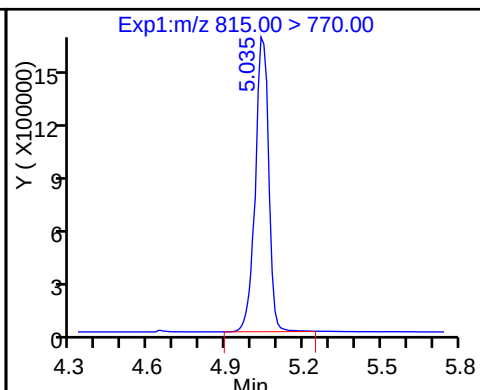
42 Perfluorotetradecanoic acid



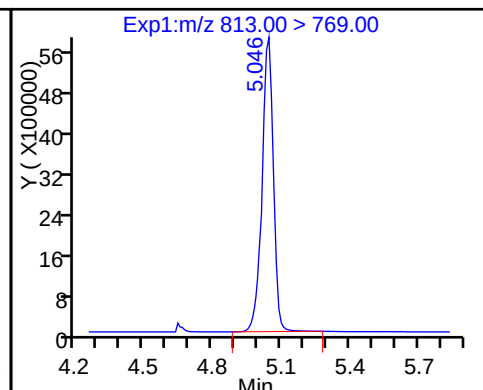
42 Perfluorotetradecanoic acid



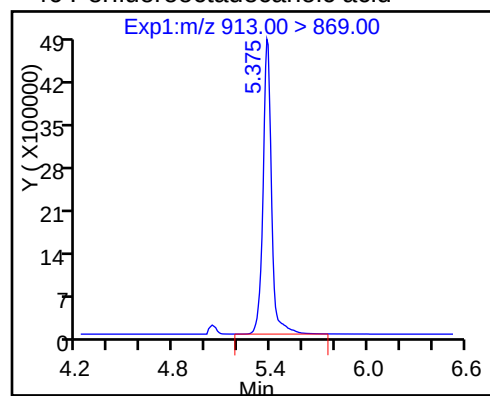
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid





## TestAmerica Sacramento

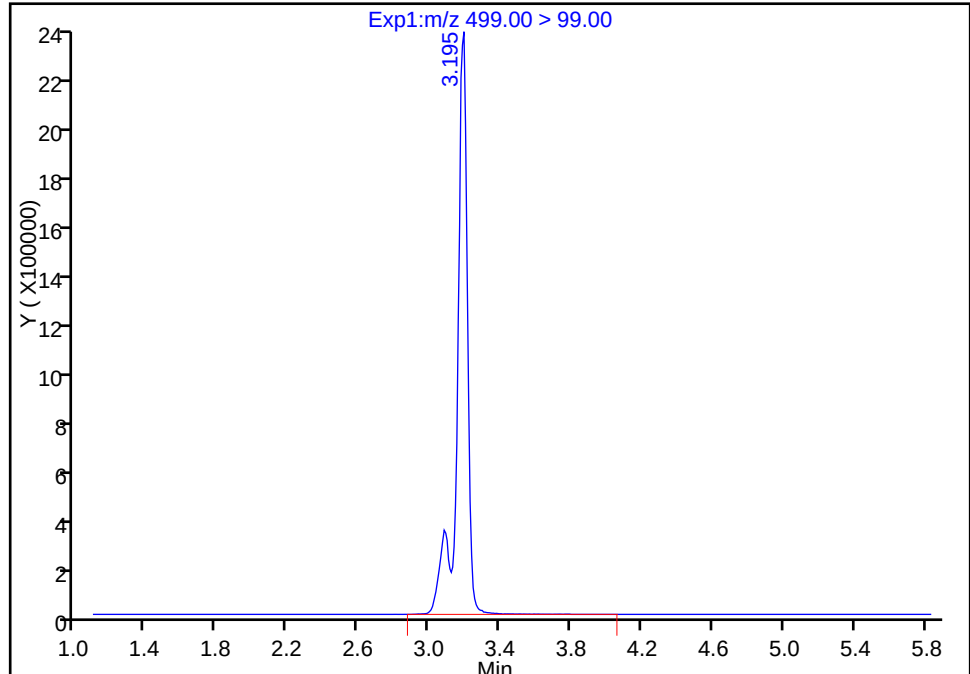
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d  
Injection Date: 01-Mar-2017 11:46:18 Instrument ID: A8\_N  
Lims ID: IC L6 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

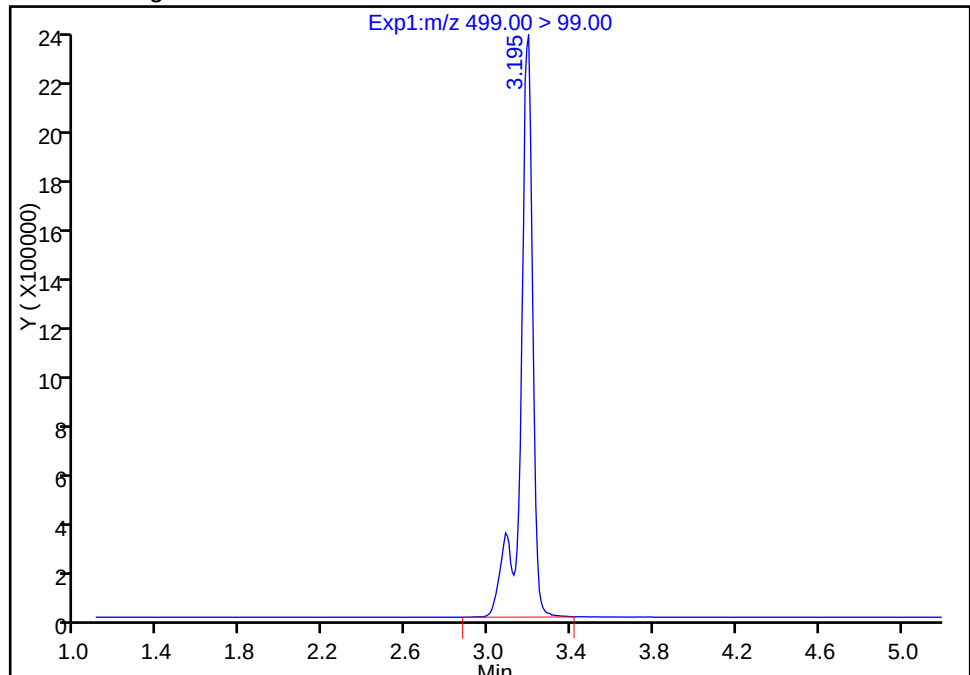
RT: 3.19  
Area: 9641533  
Amount: 146.9287  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 9596909  
Amount: 193.5024  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:18

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d

Injection Date: 01-Mar-2017 11:46:18

Instrument ID: A8\_N

Lims ID: IC L6 Full

Client ID:

Operator ID: A8-PCVA8

ALS Bottle#: 33

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

Column:

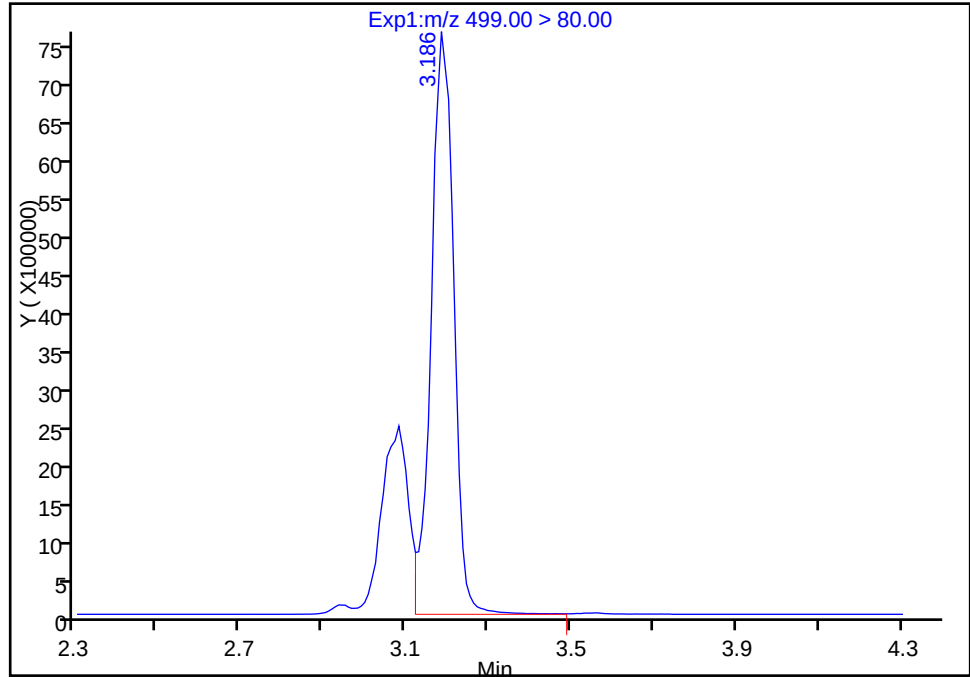
Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

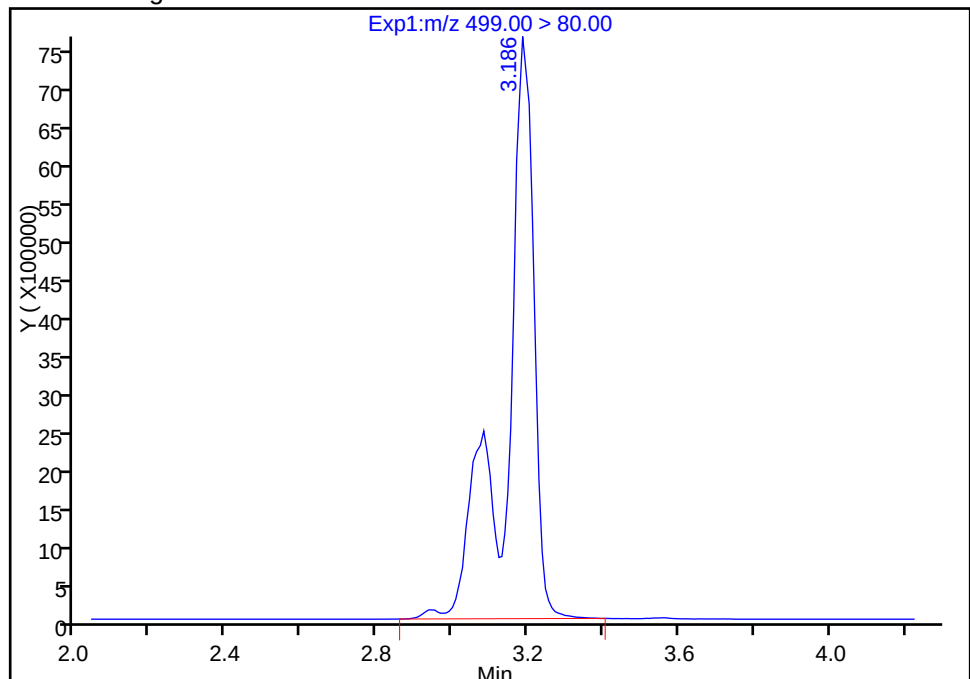
RT: 3.19  
Area: 28733218  
Amount: 146.9287  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 39756569  
Amount: 193.5024  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:18

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

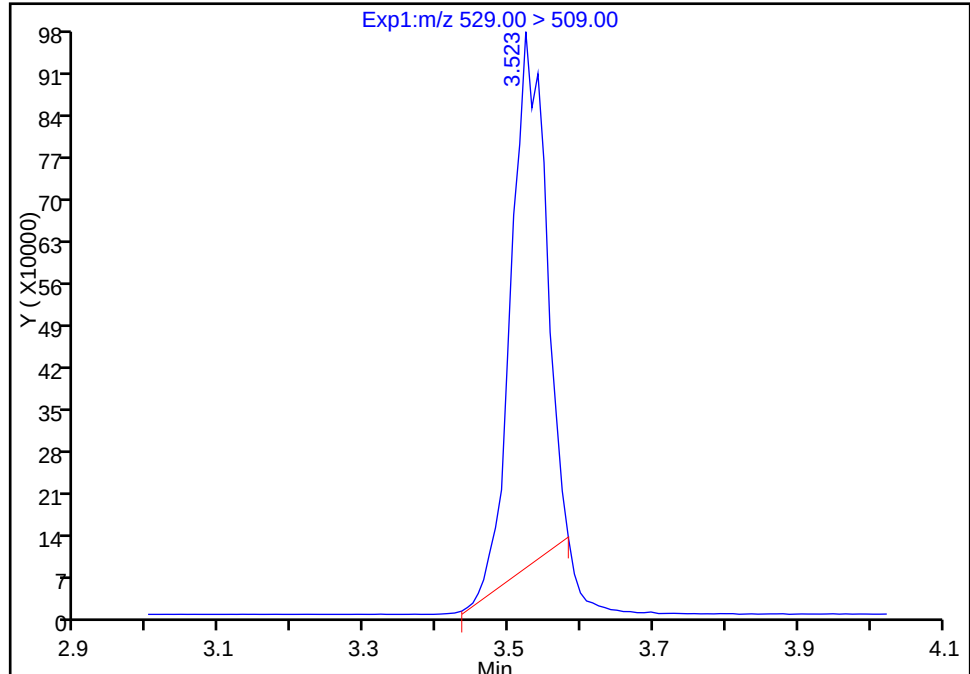
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d  
Injection Date: 01-Mar-2017 11:46:18 Instrument ID: A8\_N  
Lims ID: IC L6 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**D 26 M2-8:2FTS, CAS: STL02280**

Signal: 1

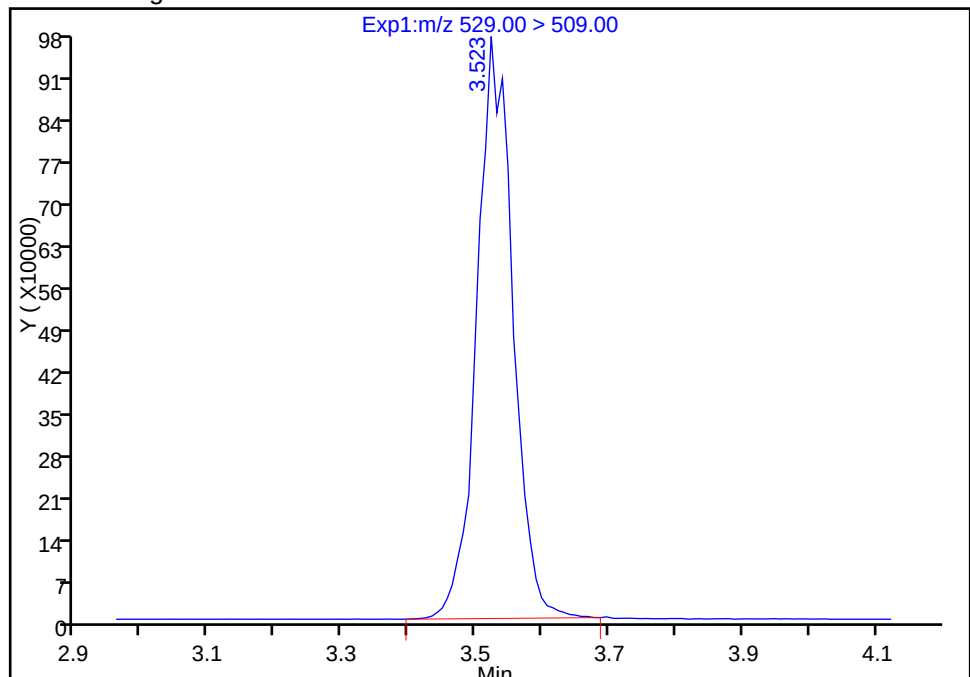
RT: 3.52  
Area: 2972144  
Amount: 32.946881  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.52  
Area: 3659550  
Amount: 39.519130  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:18

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

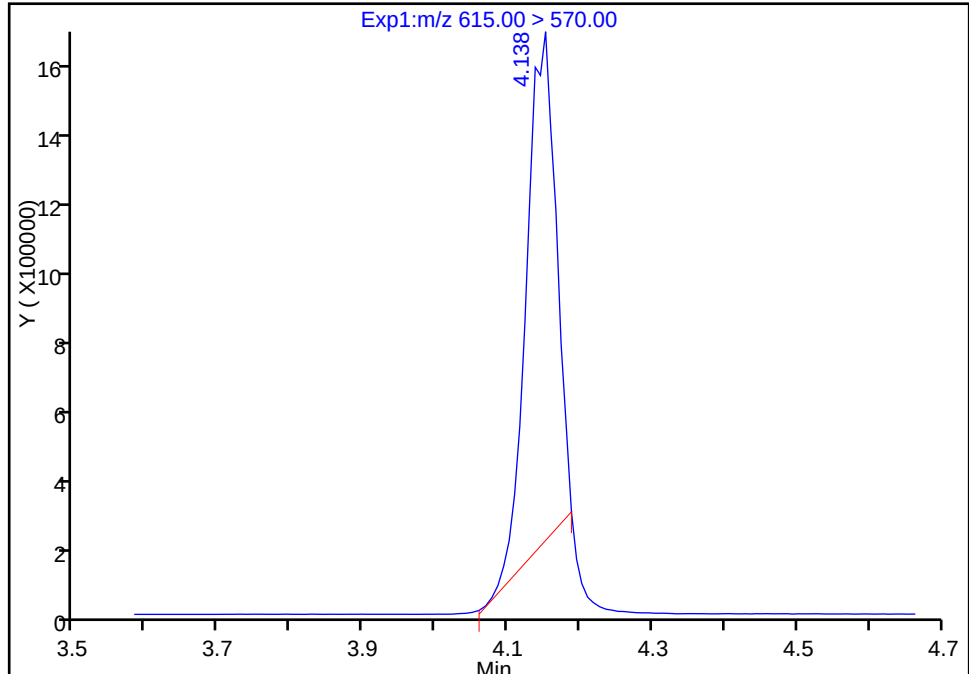
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_008.d  
Injection Date: 01-Mar-2017 11:46:18 Instrument ID: A8\_N  
Lims ID: IC L6 Full  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 33 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**D 36 13C2 PFD<sub>o</sub>A, CAS: STL00998**

Signal: 1

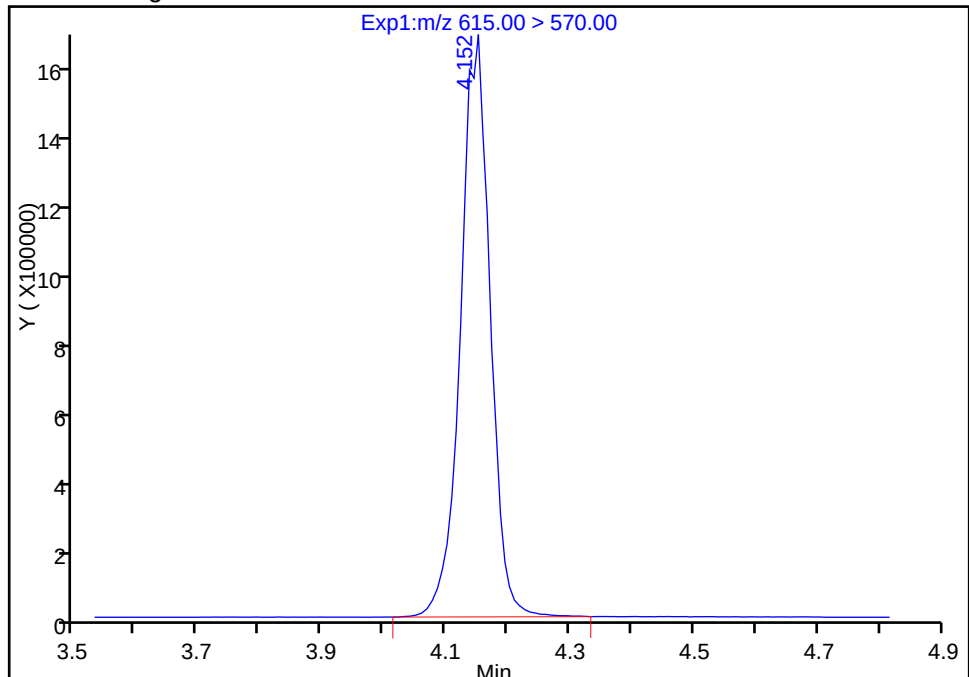
RT: 4.14  
Area: 3992056  
Amount: 33.402250  
Amount Units: ng/ml

## Processing Integration Results



RT: 4.15  
Area: 5320903  
Amount: 42.929870  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 01-Mar-2017 15:43:18

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: ICV 320-152681/13 Calibration Date: 03/01/2017 12:31

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.01CURVE\_014.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D    | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.9133 |         | 53.9        | 50.0         | 7.8   | 25.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 1.035  |         | 52.9        | 50.0         | 5.7   | 25.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.526  |         | 47.1        | 44.3         | 6.5   | 25.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.9703 |         | 54.5        | 50.0         | 9.1   | 25.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 1.045  |         | 54.0        | 50.0         | 8.0   | 25.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 1.022  |         | 47.0        | 47.3         | -0.6  | 25.0   |
| 6:2FTS                                                     | L2ID       |         | 0.9688 |         | 51.7        | 47.4         | 9.1   | 25.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.089  |         | 50.3        | 47.6         | 5.6   | 25.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 1.032  |         | 50.5        | 50.0         | 1.0   | 25.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 1.016  |         | 56.2        | 50.0         | 12.4  | 25.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 0.9166 |         | 44.5        | 47.8         | -6.8  | 25.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9785 |         | 50.6        | 47.9         | 5.7   | 25.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.9538 |         | 52.7        | 50.0         | 5.3   | 25.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.9140 |         | 50.9        | 50.0         | 1.7   | 25.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 1.014  |         | 52.2        | 50.0         | 4.4   | 25.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.6364 |         | 51.6        | 48.3         | 6.8   | 25.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 0.9789 |         | 48.3        | 50.0         | -3.4  | 25.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.998  |         | 54.8        | 50.0         | 9.7   | 25.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9755 |         | 52.1        | 50.0         | 4.3   | 25.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.9493 |         | 51.9        | 50.0         | 3.8   | 25.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 1.027  |         | 52.2        | 50.0         | 4.4   | 25.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.9439 |         | 54.0        | 50.0         | 8.1   | 25.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 2.200  |         | 55.9        | 50.0         | 11.9  | 25.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 0.9762 |         | 52.3        | 50.0         | 4.6   | 25.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.8478 |         | 59.1        | 50.0         | 18.2  | 25.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 262151 |         | 44.9        | 50.0         | -10.3 | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 201954 |         | 43.5        | 50.0         | -13.0 | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 190101 |         | 45.1        | 50.0         | -9.9  | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 172560 |         | 44.7        | 50.0         | -10.6 | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 261134 |         | 42.5        | 47.3         | -10.2 | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 67962  |         | 41.8        | 47.5         | -11.9 | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-152681/13 Calibration Date: 03/01/2017 12:31  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.01CURVE\_014.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|-------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 183068 |        | 44.7           | 50.0            | -10.7 | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 218953 |        | 43.3           | 47.8            | -9.4  | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 156812 |        | 44.1           | 50.0            | -11.8 | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 84040  |        | 43.5           | 47.9            | -9.2  | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 144616 |        | 43.4           | 50.0            | -13.3 | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 337473 |        | 46.0           | 50.0            | -8.0  | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 77141  |        | 45.3           | 50.0            | -9.4  | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 71203  |        | 43.8           | 50.0            | -12.5 | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 114237 |        | 43.7           | 50.0            | -12.7 | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 80006  |        | 45.5           | 50.0            | -9.1  | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 108741 |        | 43.9           | 50.0            | -12.3 | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 76986  |        | 45.2           | 50.0            | -9.7  | 50.0      |
| 13C2-PFTEdA  | Ave           | 259165 | 236701 |        | 45.7           | 50.0            | -8.7  | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 112974 |        | 45.2           | 50.0            | -9.7  | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_014.d  
 Lims ID: ICV Full  
 Client ID:  
 Sample Type: ICV  
 Inject. Date: 01-Mar-2017 12:31:14 ALS Bottle#: 36 Worklist Smp#: 13  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: ICV  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist:  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 01-Mar-2017 15:43:02 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK012

First Level Reviewer: chandrasenas

Date: 01-Mar-2017 14:14:09

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

D 1 13C4 PFBA

217.00 > 172.00 1.555 1.553 0.002 13107554 44.9 89.7 571827

2 Perfluorobutyric acid

212.90 > 169.00 1.555 1.558 -0.003 1.000 11971584 53.9 121786

D 3 13C5-PFPeA

267.90 > 223.00 1.833 1.832 0.001 10097715 43.5 87.0 496223

4 Perfluoropentanoic acid

262.90 > 219.00 1.833 1.835 -0.002 1.000 10448730 52.9 87028

5 Perfluorobutanesulfonic acid

298.90 > 80.00 1.873 1.872 0.001 1.000 17632155 47.1  
 298.90 > 99.00 1.873 1.872 0.001 1.000 7534911 2.34(0.00-0.00)

6 Perfluorohexanoic acid

313.00 > 269.00 2.131 2.133 -0.002 1.000 9222580 54.5 268407

D 7 13C2 PFHxA

315.00 > 270.00 2.131 2.134 -0.003 9505049 45.1 90.1 530814

10 Perfluoroheptanoic acid

363.00 > 319.00 2.472 2.474 -0.002 1.000 9017371 54.0 66655

D 9 13C4-PFHpA

367.00 > 322.00 2.472 2.475 -0.003 8627993 44.7 89.4 271737

8 Perfluorohexanesulfonic acid

399.00 > 80.00 2.487 2.485 0.002 1.000 12611730 47.0

D 11 18O2 PFHxS

403.00 > 84.00 2.487 2.489 -0.002 12351647 42.5 89.8 385748

D 12 M2-6:2FTS

429.00 > 409.00 2.806 2.805 0.001 3228217 41.8 88.1

13 Sodium 1H,1H,2H,2H-perfluorooctane

427.00 > 407.00 2.814 2.807 0.007 1.000 3120919 51.7

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.837 | 2.835  | 0.002  | 1.000  | 9449558  | 50.5         |                 |      | 213564 |       |
| 413.00 > 169.00                       | 2.837 | 2.835  | 0.002  | 1.000  | 5623231  |              | 1.68(0.90-1.10) |      | 140434 |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.837 | 2.835  | 0.002  |        | 9153420  | 44.7         |                 | 89.3 | 333609 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.837 | 2.842  | -0.005 | 1.000  | 11351727 | 50.3         |                 |      |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.205 | 3.145  | 0.060  | 1.000  | 9582813  | 44.5         |                 |      | 334324 |       |
| 499.00 > 99.00                        | 3.205 | 3.145  | 0.060  | 1.000  | 2425871  |              | 3.95(0.90-1.10) |      | 705291 |       |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.205 | 3.202  | 0.003  | 1.000  | 7968593  | 56.2         |                 |      | 153203 |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.196 | 3.204  | -0.008 |        | 10465937 | 43.3         |                 | 90.6 | 197571 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.205 | 3.208  | -0.003 |        | 7840582  | 44.1         |                 | 88.2 | 207818 |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.539 | 3.545  | -0.006 |        | 4025496  | 43.5         |                 | 90.8 |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.539 | 3.546  | -0.007 | 1.000  | 3938788  | 50.6         |                 |      |        |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.573 | 3.559  | 0.014  |        | 16873653 | 46.0         |                 | 92.0 | 313140 |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.556 | 3.560  | -0.004 | 1.000  | 6896912  | 52.7         |                 |      | 187300 |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.556 | 3.560  | -0.004 |        | 7230800  | 43.4         |                 | 86.8 | 175077 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.573 | 3.561  | 0.012  | 1.000  | 15422698 | 50.9         |                 |      | 322048 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.706 | 3.710  | -0.004 |        | 3857056  | 45.3         |                 | 90.6 |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.706 | 3.713  | -0.007 | 1.000  | 3910569  | 52.2         |                 |      |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.862 | 3.866  | -0.004 | 1.000  | 6723491  | 51.6         |                 |      |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.871 | 3.875  | -0.004 |        | 3560139  | 43.8         |                 | 87.5 |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.880 | 3.876  | 0.004  |        | 5711825  | 43.7         |                 | 87.3 | 216355 |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.871 | 3.878  | -0.007 | 1.000  | 5591035  | 48.3         |                 |      | 127404 |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.880 | 3.883  | -0.003 | 1.002  | 3554390  | 54.8         |                 |      |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.062 | 4.050  | 0.012  |        | 4000304  | 45.5         |                 | 90.9 |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.070 | 4.057  | 0.013  | 1.000  | 3902092  | 52.1         |                 |      |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.155 | 4.162  | -0.007 | 1.000  | 5161221  | 51.9         |                 |      | 95672  |       |



| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.155 | 4.164     | -0.009    |           | 5437061  | 43.9            |                 | 87.7 | 128920 |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.247 | 4.235     | 0.012     |           | 3849308  | 45.2            |                 | 90.3 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.256 | 4.242     | 0.014     | 1.000     | 3953838  | 52.2            |                 |      |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.417 | 4.424     | -0.007    | 1.000     | 5131863  | 54.0            |                 |      | 76799  |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.651 | 4.655     | -0.004    |           | 11835060 | 45.7            |                 | 91.3 | 267097 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.651 | 4.657     | -0.006    | 1.000     | 11961738 | 55.9            |                 |      | 110355 |       |
| 713.00 > 169.00                       | 4.641 | 4.657     | -0.016    | 0.998     | 1569975  |                 | 7.62(0.00-0.00) |      | 118035 |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.049 | 5.057     | -0.008    |           | 5648694  | 45.2            |                 | 90.3 | 81356  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.049 | 5.059     | -0.010    | 1.000     | 5307447  | 52.3            |                 |      | 5849   |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.384 | 5.399     | -0.015    | 1.000     | 4609565  | 59.1            |                 |      | 5082   |       |

**Reagents:**

LCPFCIC\_FULL\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_014.d

Injection Date: 01-Mar-2017 12:31:14

Instrument ID: A8\_N

Lims ID: ICV Full

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 36

Worklist Smp#: 13

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

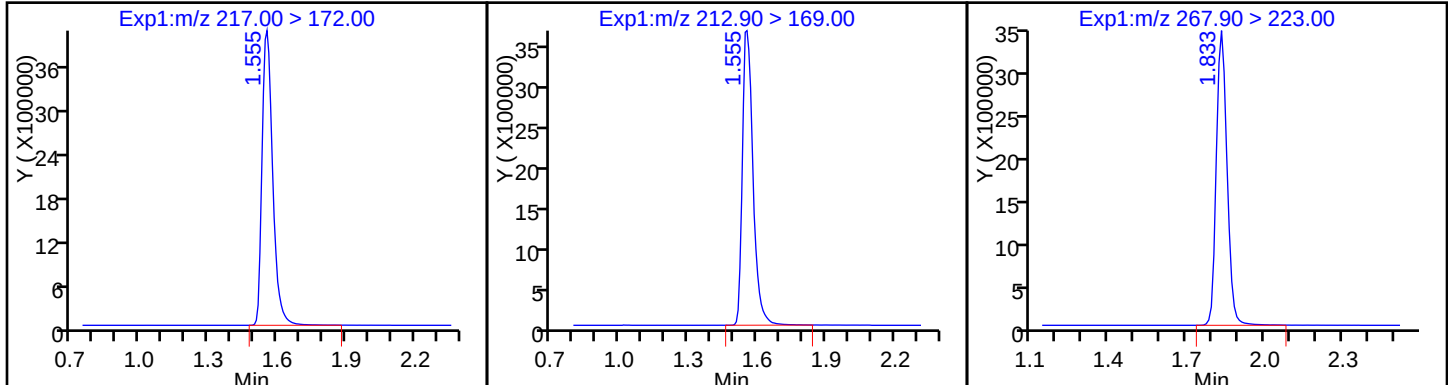
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

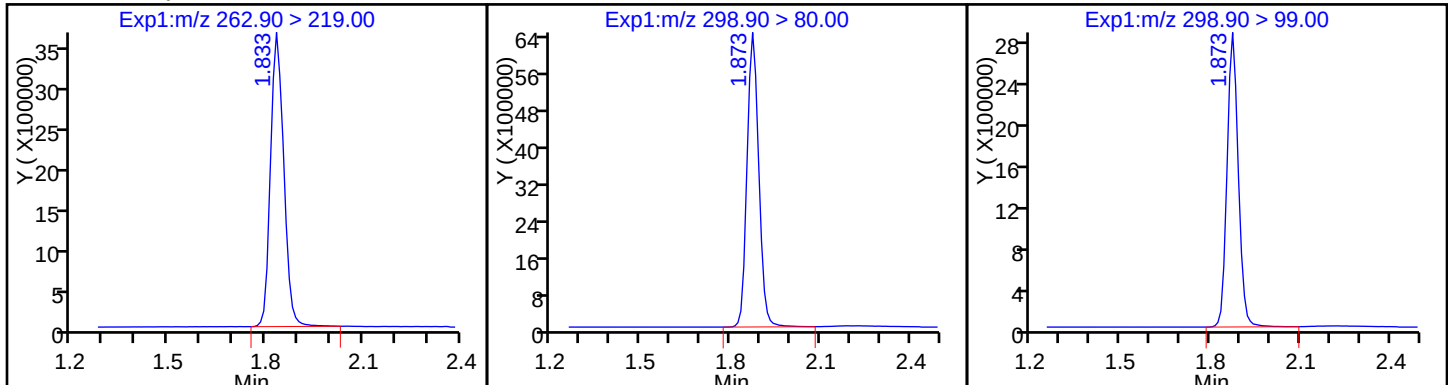
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

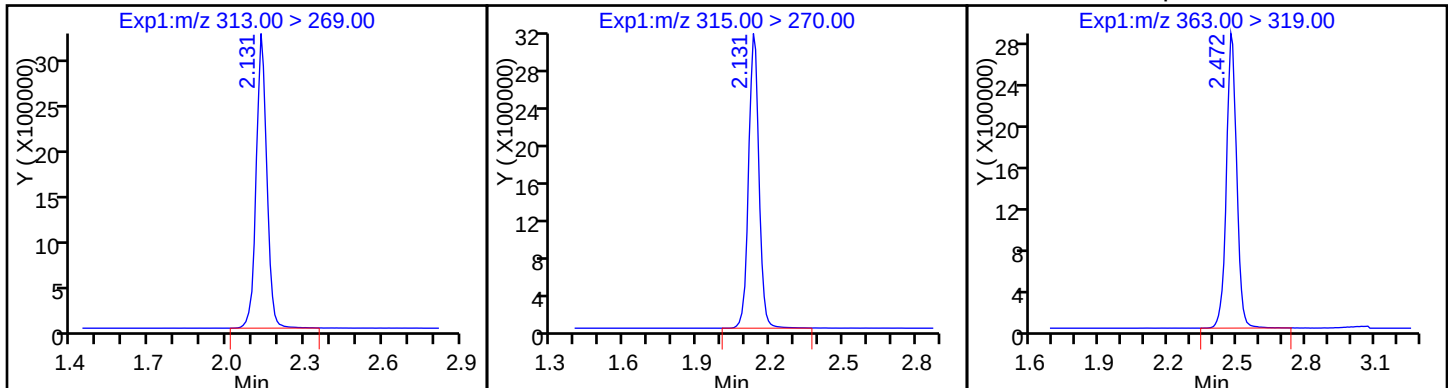
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

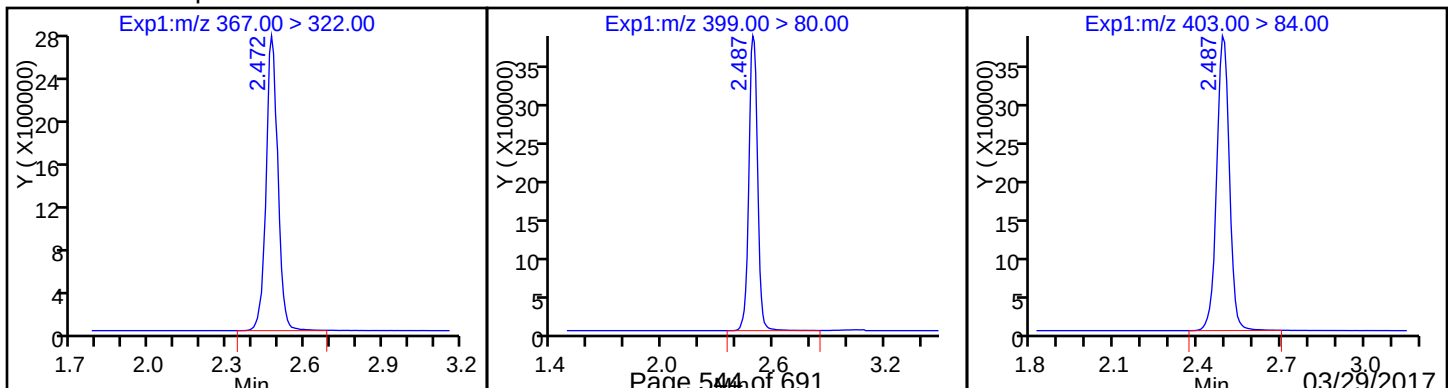
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA

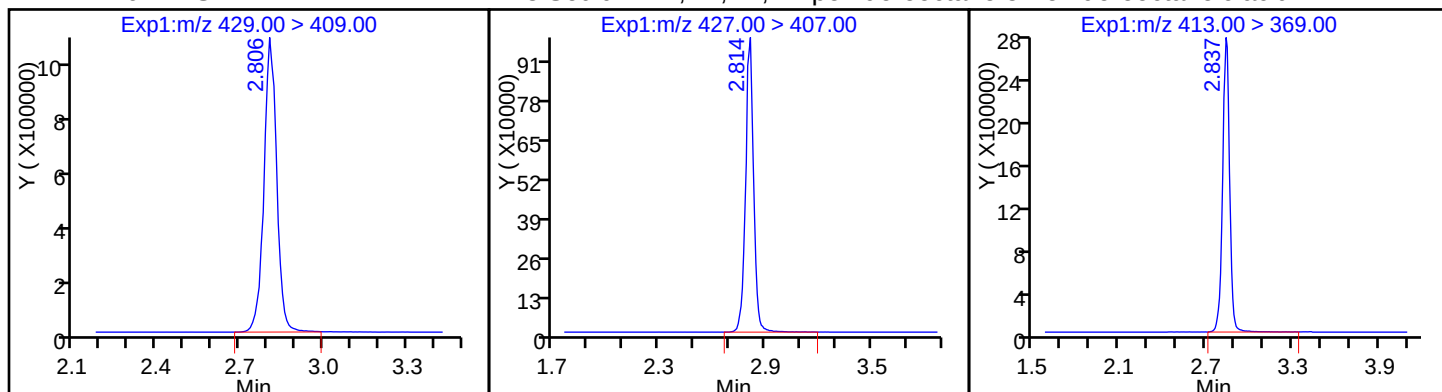
8 Perfluorohexanesulfonic acid

D 11 18O2 PFHxS



D 12 M2-6:2FTS

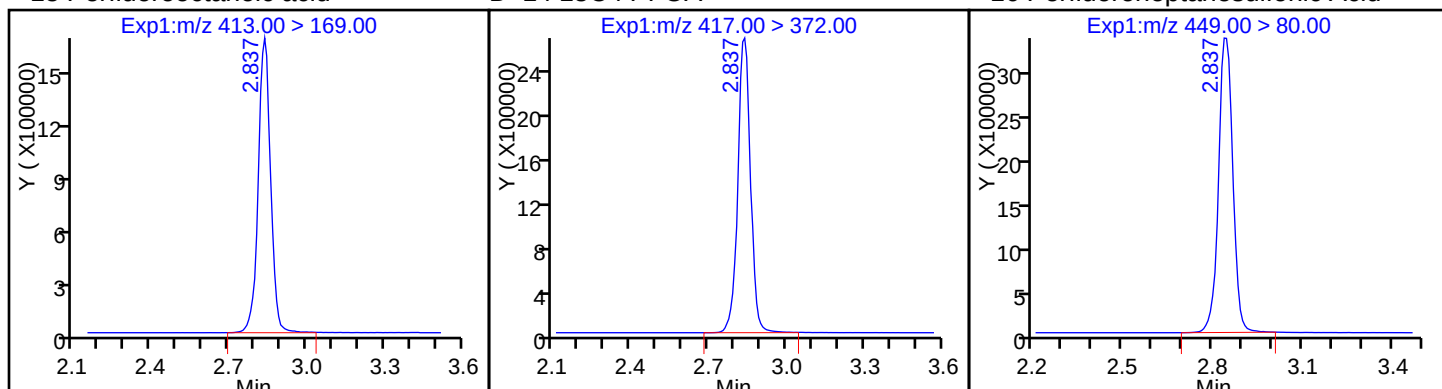
13 Sodium 1H,1H,2H,2H-perfluorooctan-1-ol 15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

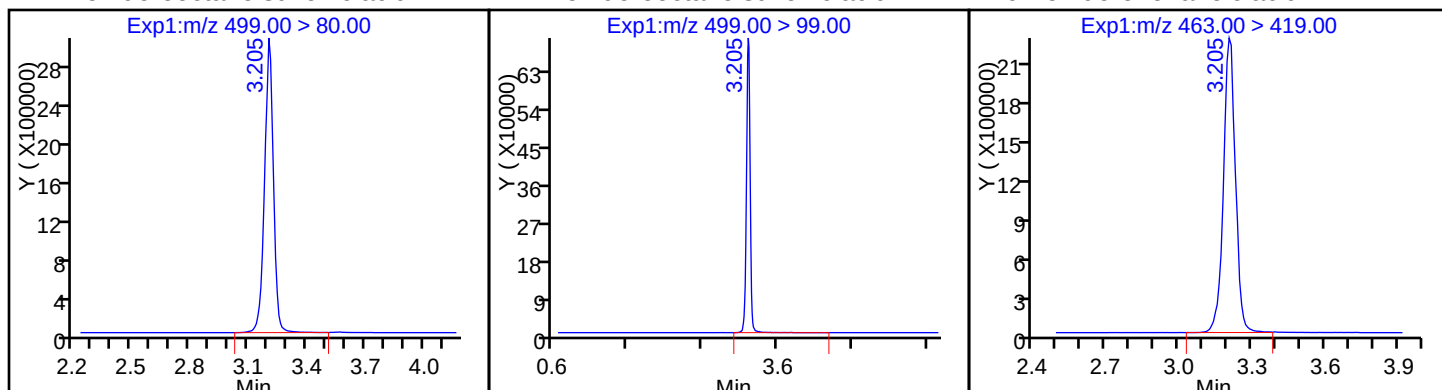
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid

17 Perfluorooctane sulfonic acid

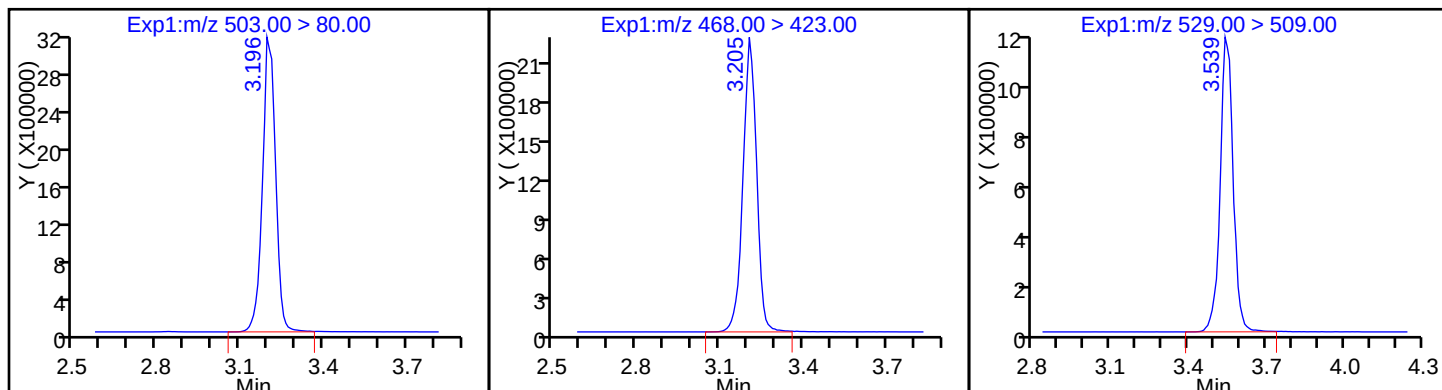
20 Perfluorononanoic acid



D 18 13C4 PFOS

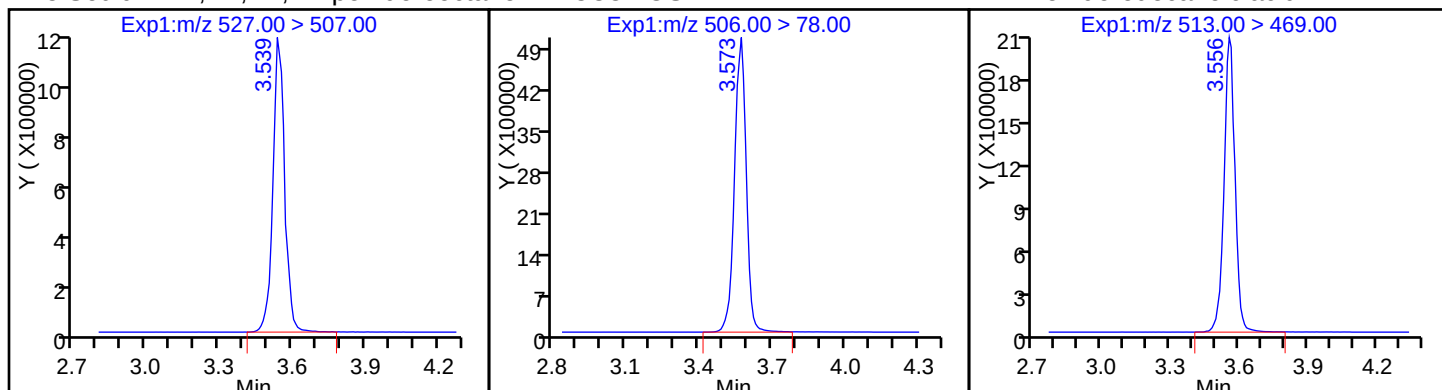
D 19 13C5 PFNA

D 26 M2-8:2FTS



## 25 Sodium 1H,1H,2H,2H-perfluorooctadec-21 13C8 FOSA

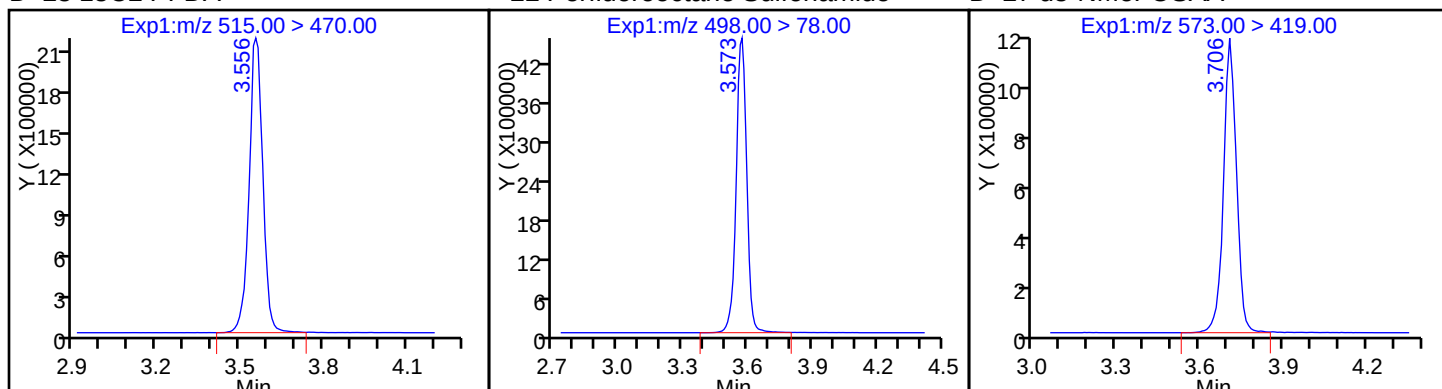
## 24 Perfluorodecanoic acid



## D 23 13C2 PFDA

## 22 Perfluorooctane Sulfonamide

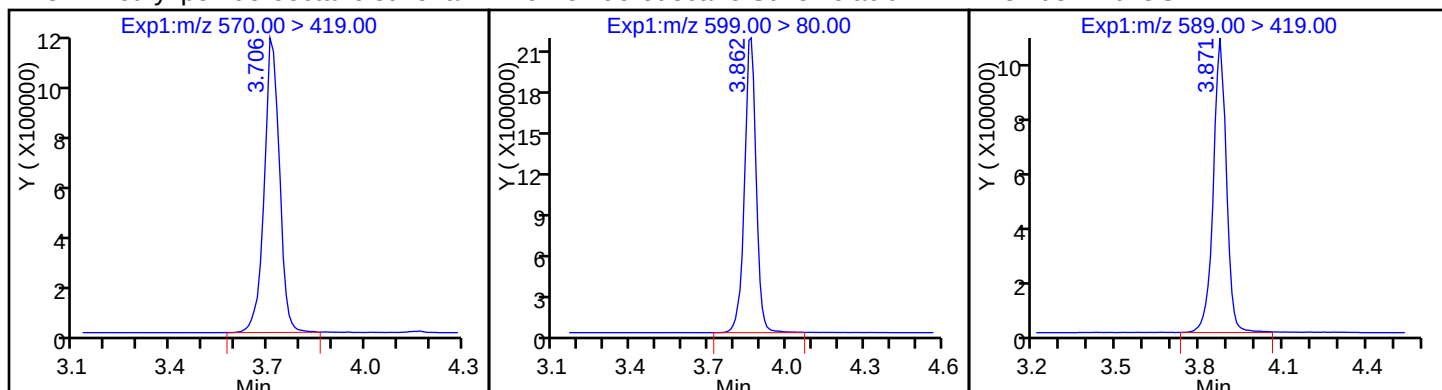
## D 27 d3-NMeFOSAA



## 28 N-methyl perfluorooctane sulfonami

## 29 Perfluorodecane Sulfonic acid

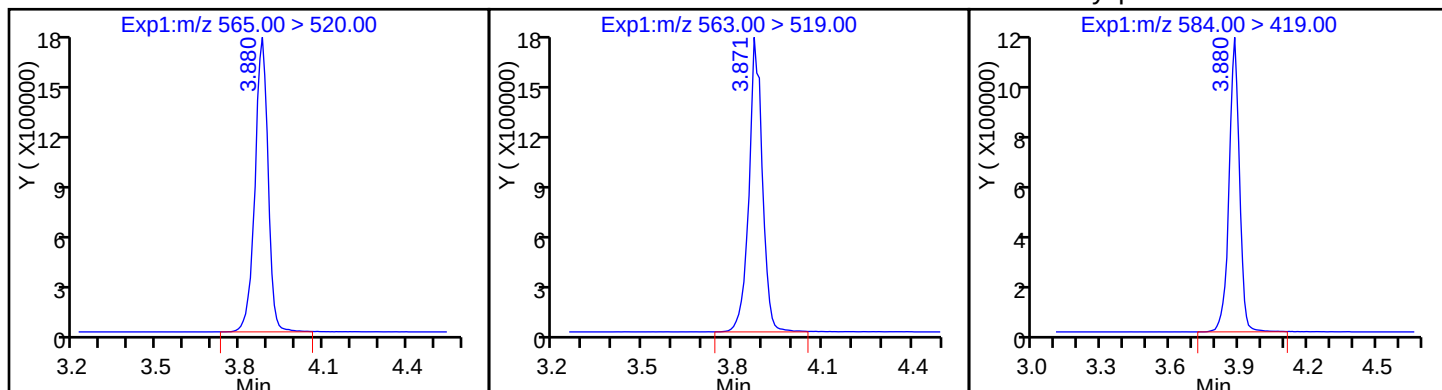
## D 32 d5-NEtFOSAA



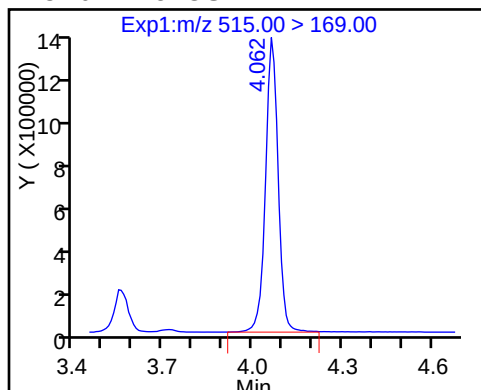
## D 30 13C2 PFUnA

## 31 Perfluoroundecanoic acid

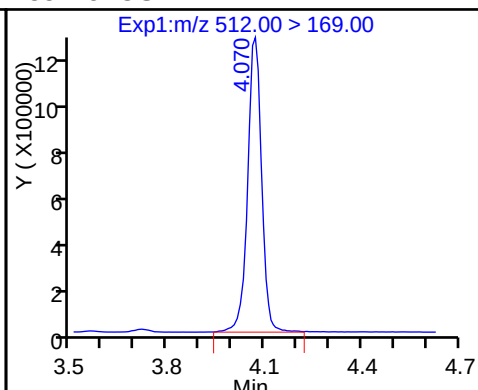
## 33 N-ethyl perfluorooctane sulfonamid



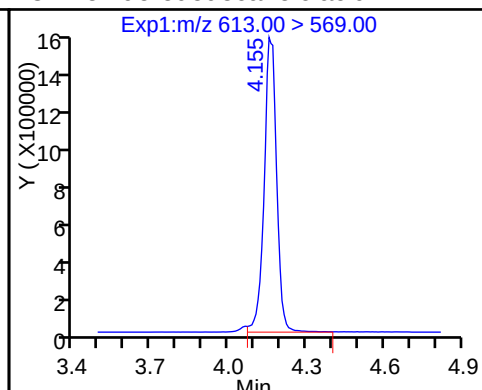
D 34 d-N-MeFOSA-M



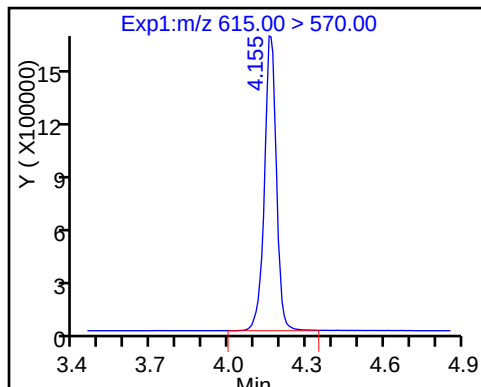
35 MeFOSA



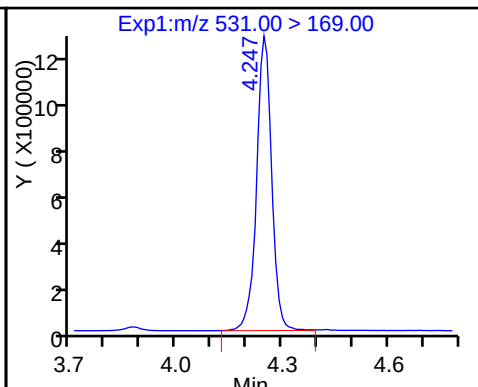
37 Perfluorododecanoic acid



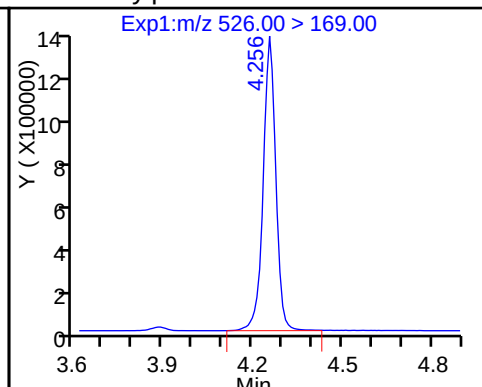
D 36 13C2 PFDa



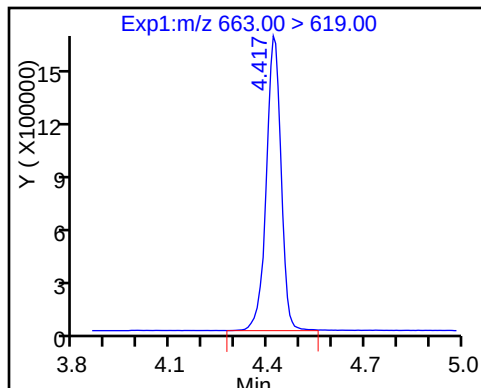
D 38 d-N-EtFOSA-M



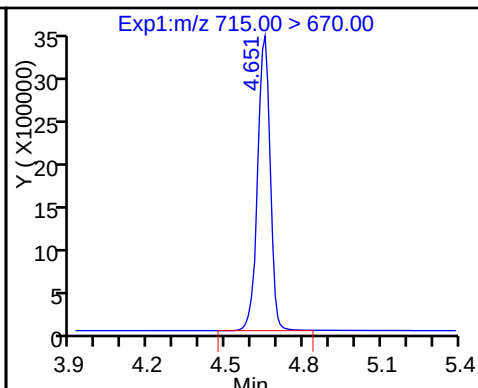
39 N-ethylperfluoro-1-octanesulfonami



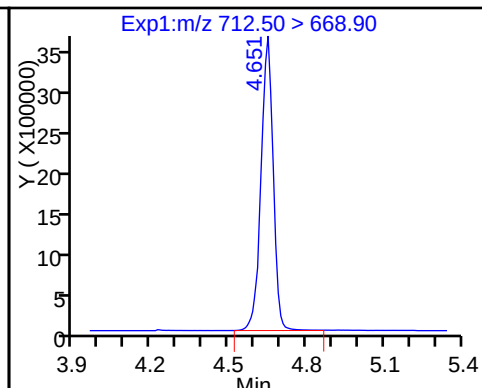
41 Perfluorotridecanoic acid



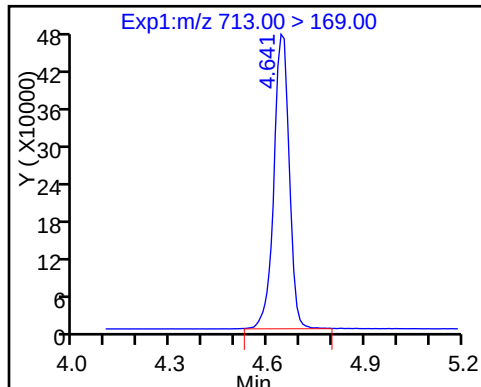
D 43 13C2-PFTeDa



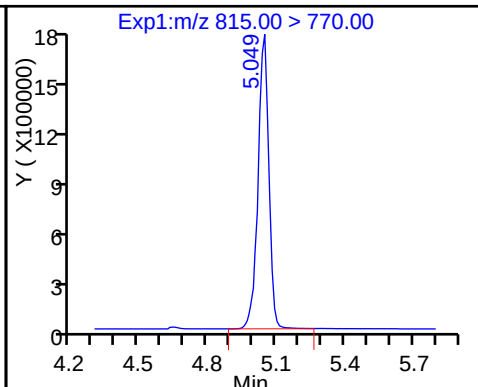
42 Perfluorotetradecanoic acid



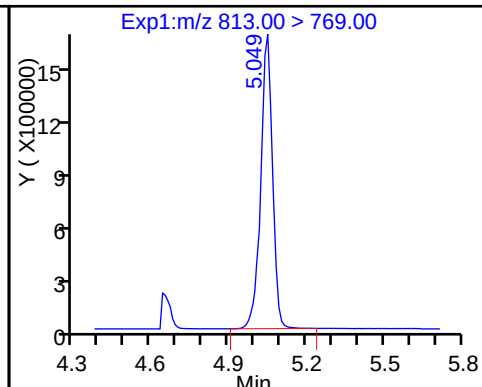
42 Perfluorotetradecanoic acid



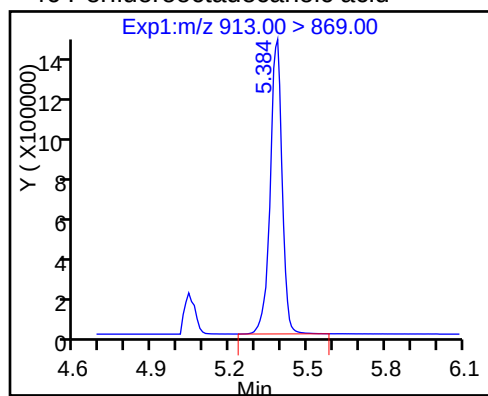
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: CCV 320-154503/1 Calibration Date: 03/11/2017 12:34

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.11C\_004.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D    | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.8603 |         | 1.02        | 1.00         | 1.5   | 50.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 1.106  |         | 1.13        | 1.00         | 13.1  | 50.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.529  |         | 0.944       | 0.884        | 6.8   | 50.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.9177 |         | 1.03        | 1.00         | 3.2   | 50.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 0.9703 |         | 1.00        | 1.00         | 0.3   | 50.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 1.189  |         | 1.05        | 0.910        | 15.6  | 50.0   |
| 6:2FTS                                                     | L2ID       |         | 1.215  |         | 1.16        | 0.948        | 22.9  | 50.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 1.077  |         | 1.05        | 1.00         | 5.4   | 50.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.065  |         | 0.983       | 0.952        | 3.3   | 50.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 1.046  |         | 0.987       | 0.928        | 6.3   | 50.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 0.9180 |         | 1.02        | 1.00         | 1.5   | 50.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.8981 |         | 1.00        | 1.00         | -0.0  | 50.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9772 |         | 0.929       | 0.958        | -3.1  | 50.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.9010 |         | 0.995       | 1.00         | -0.5  | 50.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 0.9874 |         | 1.02        | 1.00         | 1.7   | 50.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.5682 |         | 0.920       | 0.964        | -4.6  | 50.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 1.029  |         | 1.02        | 1.00         | 1.5   | 50.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.9191 |         | 1.01        | 1.00         | 1.0   | 50.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9718 |         | 1.04        | 1.00         | 3.9   | 50.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 0.9816 |         | 0.998       | 1.00         | -0.2  | 50.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.8999 |         | 0.984       | 1.00         | -1.6  | 50.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.8744 |         | 1.00        | 1.00         | 0.1   | 50.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 1.464  |         | 0.745       | 1.00         | -25.5 | 50.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 1.281  |         | 1.01        | 1.00         | 0.6   | 50.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.5790 |         | 0.807       | 1.00         | -19.3 | 50.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 324941 |         | 55.6        | 50.0         | 11.2  | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 253826 |         | 54.7        | 50.0         | 9.3   | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 239481 |         | 56.8        | 50.0         | 13.6  | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 218030 |         | 56.5        | 50.0         | 13.0  | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 331233 |         | 53.9        | 47.3         | 13.9  | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 95744  |         | 58.9        | 47.5         | 24.1  | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-154503/1 Calibration Date: 03/11/2017 12:34  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.11C\_004.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|-------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 230925 |        | 56.3           | 50.0            | 12.7  | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 262439 |        | 51.9           | 47.8            | 8.6   | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 190511 |        | 53.6           | 50.0            | 7.1   | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 412048 |        | 56.1           | 50.0            | 12.3  | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 102811 |        | 53.2           | 47.9            | 11.0  | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 176211 |        | 52.9           | 50.0            | 5.7   | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 77543  |        | 45.5           | 50.0            | -9.0  | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 133960 |        | 51.2           | 50.0            | 2.4   | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 80643  |        | 49.6           | 50.0            | -0.9  | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 83824  |        | 47.6           | 50.0            | -4.7  | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 80383  |        | 47.1           | 50.0            | -5.7  | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 117054 |        | 47.2           | 50.0            | -5.6  | 50.0      |
| 13C2-PFTeDA  | Ave           | 259165 | 218619 |        | 42.2           | 50.0            | -15.6 | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 98970  |        | 39.6           | 50.0            | -20.9 | 50.0      |



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d  
 Lims ID: CCV L2  
 Client ID:  
 Sample Type: CCVL  
 Inject. Date: 11-Mar-2017 12:34:59 ALS Bottle#: 29 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L2  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub14  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 13-Mar-2017 11:41:36 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK033

First Level Reviewer: changnoit

Date: 13-Mar-2017 11:41:36

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N     | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|---------|-------|
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |         | M     |
| 212.90 > 169.00                       | 1.555 | 1.555  | 0.0    | 1.000  | 279561   | 1.02         |                 | 102  | 2519    | M     |
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |         |       |
| 217.00 > 172.00                       | 1.555 | 1.555  | 0.0    |        | 16247054 | 55.6         |                 | 111  | 1051483 |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |         |       |
| 267.90 > 223.00                       | 1.843 | 1.843  | 0.0    |        | 12691275 | 54.7         |                 | 109  | 774167  |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |         |       |
| 262.90 > 219.00                       | 1.843 | 1.843  | 0.0    | 1.000  | 280803   | 1.13         |                 | 113  | 2501    |       |
| D 47 13C3-PFBS                        |       |        |        |        |          |              |                 |      |         |       |
| 301.90 > 83.00                        | 1.873 | 1.873  | 0.0    |        | 326416   | NC           |                 |      |         |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |         |       |
| 298.90 > 80.00                        | 1.883 | 1.883  | 0.0    | 1.000  | 447832   | 0.9438       |                 | 107  |         |       |
| 298.90 > 99.00                        | 1.883 | 1.883  | 0.0    | 1.000  | 181715   |              | 2.46(0.00-0.00) |      |         |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |         |       |
| 315.00 > 270.00                       | 2.147 | 2.147  | 0.0    |        | 11974057 | 56.8         |                 | 114  | 427406  |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |         |       |
| 313.00 > 269.00                       | 2.147 | 2.147  | 0.0    | 1.000  | 219759   | 1.03         |                 | 103  | 6402    |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |         | M     |
| 399.00 > 80.00                        | 2.518 | 2.518  | 0.0    | 1.000  | 358301   | 1.05         |                 | 116  |         | M     |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |         |       |
| 367.00 > 322.00                       | 2.503 | 2.503  | 0.0    |        | 10901517 | 56.5         |                 | 113  | 411772  |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |         |       |
| 363.00 > 319.00                       | 2.495 | 2.495  | 0.0    | 1.000  | 211550   | 1.00         |                 | 100  | 2594    |       |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |         |       |
| 403.00 > 84.00                        | 2.518 | 2.518  | 0.0    |        | 15667334 | 53.9         |                 | 114  | 589222  |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |         |       |
| 427.00 > 407.00                       | 2.845 | 2.845  | 0.0    | 1.000  | 110320   | 1.16         |                 | 123  |         |       |

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec  | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|-------|--------|-------|
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |       |        |       |
| 429.00 > 409.00                       | 2.845 | 2.845  | 0.0    |        | 4547840  | 58.9         |                 | 124   |        |       |
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |       |        |       |
| 413.00 > 369.00                       | 2.876 | 2.876  | 0.0    | 1.000  | 248749   | 1.05         |                 | 105   | 2321   |       |
| 413.00 > 169.00                       | 2.876 | 2.876  | 0.0    | 1.000  | 143209   |              | 1.74(0.90-1.10) |       | 6480   |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |       |        |       |
| 417.00 > 372.00                       | 2.876 | 2.876  | 0.0    |        | 11546259 | 56.3         |                 | 113   | 467397 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |       |        |       |
| 449.00 > 80.00                        | 2.884 | 2.884  | 0.0    | 1.000  | 265961   | 0.9830       |                 | 103   |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |       |        |       |
| 499.00 > 80.00                        | 3.248 | 3.248  | 0.0    | 1.000  | 254636   | 0.9866       |                 | 106   | 15097  | M     |
| 499.00 > 99.00                        | 3.257 | 3.248  | 0.009  | 1.003  | 59515    |              | 4.28(0.90-1.10) |       | 3930   | M     |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |       |        |       |
| 503.00 > 80.00                        | 3.257 | 3.257  | 0.0    |        | 12544575 | 51.9         |                 | 109   | 446124 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |       |        |       |
| 468.00 > 423.00                       | 3.257 | 3.257  | 0.0    |        | 9525540  | 53.6         |                 | 107   | 346179 |       |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |       |        |       |
| 463.00 > 419.00                       | 3.265 | 3.265  | 0.0    | 1.000  | 174880   | 1.02         |                 | 102   | 3039   |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |       |        |       |
| 506.00 > 78.00                        | 3.542 | 3.542  | 0.0    |        | 20602398 | 56.1         |                 | 112   | 732701 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |       |        |       |
| 498.00 > 78.00                        | 3.542 | 3.542  | 0.0    | 1.000  | 370071   | 1.00         |                 | 100.0 | 25059  |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |       |        |       |
| 527.00 > 507.00                       | 3.609 | 3.609  | 0.0    | 1.000  | 96246    | 0.9285       |                 | 96.9  |        |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |       |        |       |
| 529.00 > 509.00                       | 3.609 | 3.609  | 0.0    |        | 4924634  | 53.2         |                 | 111   |        |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |       |        |       |
| 513.00 > 469.00                       | 3.618 | 3.618  | 0.0    | 1.000  | 158763   | 0.99         |                 | 99.5  | 5454   |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |       |        |       |
| 515.00 > 470.00                       | 3.618 | 3.618  | 0.0    |        | 8810537  | 52.9         |                 | 106   | 167928 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |       |        |       |
| 573.00 > 419.00                       | 3.770 | 3.770  | 0.0    |        | 3877141  | 45.5         |                 | 91.0  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |       |        |       |
| 570.00 > 419.00                       | 3.780 | 3.780  | 0.0    | 1.003  | 76562    | 1.02         |                 | 102   |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |       |        |       |
| 599.00 > 80.00                        | 3.929 | 3.929  | 0.0    | 1.000  | 143760   | 0.9196       |                 | 95.4  |        |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |       |        |       |
| 589.00 > 419.00                       | 3.946 | 3.946  | 0.0    |        | 4032138  | 49.6         |                 | 99.1  |        |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |       |        |       |
| 563.00 > 519.00                       | 3.946 | 3.946  | 0.0    | 1.000  | 137871   | 1.02         |                 | 102   | 3348   |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |       |        |       |
| 565.00 > 520.00                       | 3.946 | 3.946  | 0.0    |        | 6697996  | 51.2         |                 | 102   | 240531 |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |       |        |       |
| 584.00 > 419.00                       | 3.955 | 3.955  | 0.0    | 1.002  | 74121    | 1.01         |                 | 101   |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |       |        |       |
| 515.00 > 169.00                       | 4.020 | 4.020  | 0.0    |        | 4191181  | 47.6         |                 | 95.3  |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |       |        |       |
| 512.00 > 169.00                       | 4.029 | 4.029  | 0.0    | 1.000  | 81458    | 1.04         |                 | 104   |        |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.207 | 4.207     | 0.0       |           | 4019167  | 47.1            |                 | 94.3 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.215 | 4.215     | 0.0       | 1.000     | 78903    | 1.00            |                 | 99.8 |        |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 613.00 > 569.00                       | 4.250 | 4.250     | 0.0       | 1.000     | 105335   | 0.9840          |                 | 98.4 | 744    |       |
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.241 | 4.241     | 0.0       |           | 5852720  | 47.2            |                 | 94.4 | 190789 |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.520 | 4.520     | 0.0       | 1.000     | 102353   | 1.00            |                 | 100  | 353    |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.749 | 4.749     | 0.0       |           | 10930969 | 42.2            |                 | 84.4 | 290330 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.749 | 4.749     | 0.0       | 1.000     | 171423   | 0.7447          |                 | 74.5 | 73.1   |       |
| 713.00 > 169.00                       | 4.749 | 4.749     | 0.0       | 1.000     | 32769    |                 | 5.23(0.00-0.00) |      | 10329  |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.188 | 5.188     | 0.0       |           | 4948492  | 39.6            |                 | 79.1 | 85212  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.188 | 5.188     | 0.0       | 1.000     | 149969   | 1.01            |                 | 101  | 146    |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.567 | 5.567     | 0.0       | 1.000     | 67771    | 0.8069          |                 | 80.7 | 86.5   |       |

**QC Flag Legend**

## Processing Flags

NC - Not Calibrated

## Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L2\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d

Injection Date: 11-Mar-2017 12:34:59

Instrument ID: A8\_N

Lims ID: CCV L2

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 29

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

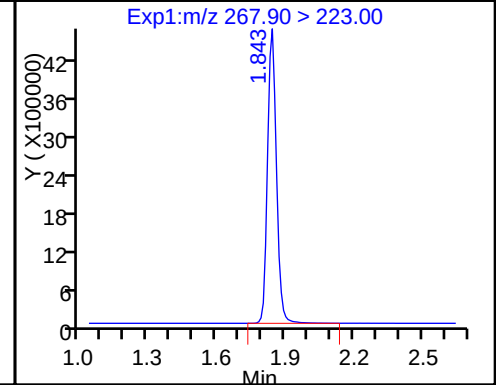
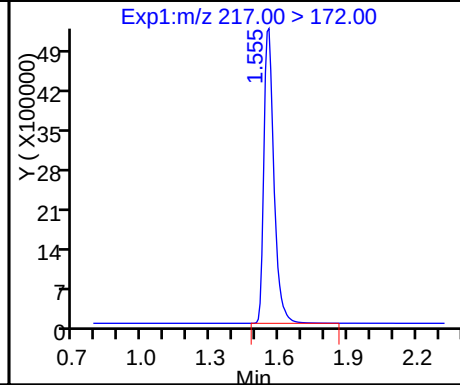
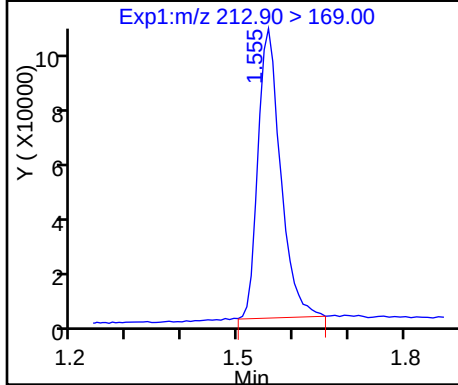
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

2 Perfluorobutyric acid (M)

D 1 13C4 PFBA

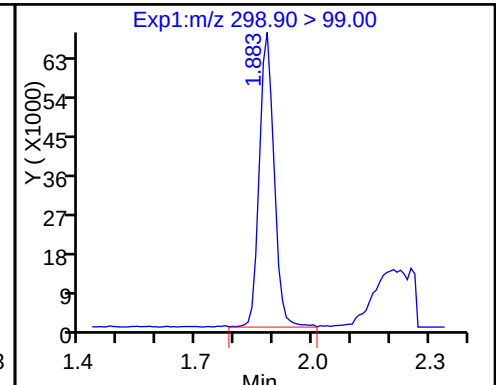
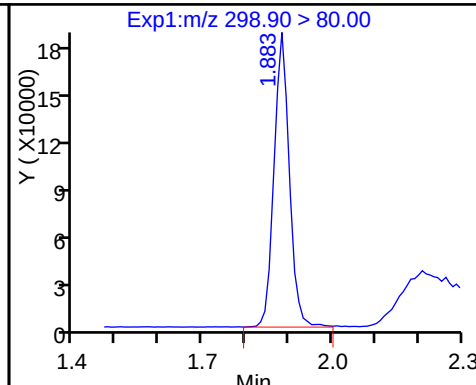
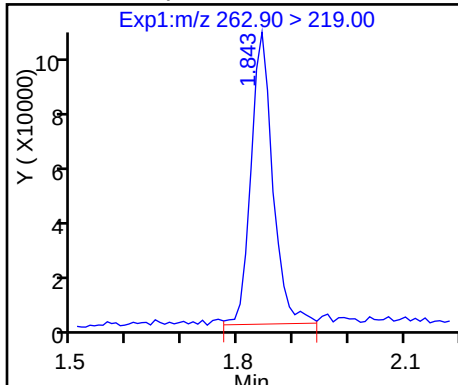
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

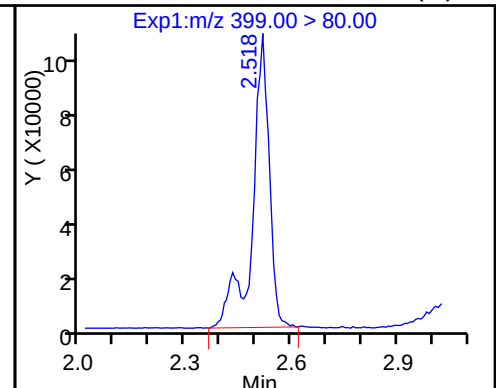
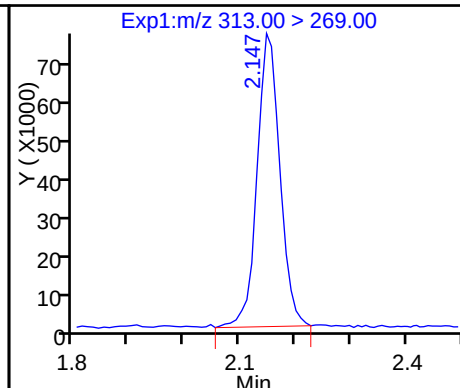
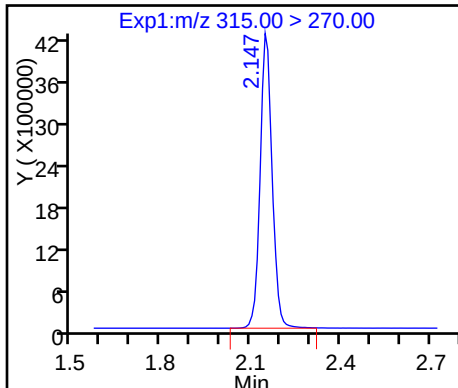
5 Perfluorobutanesulfonic acid



D 7 13C2 PFHxA

6 Perfluorohexanoic acid

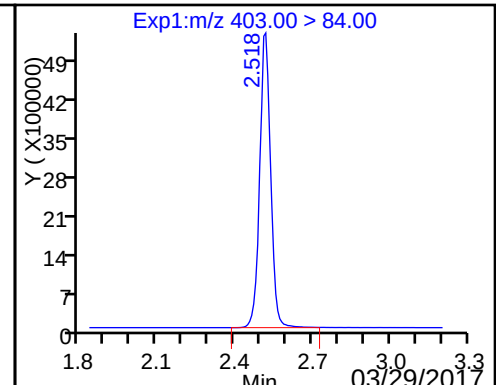
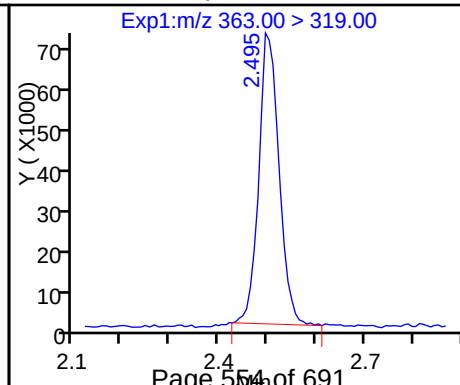
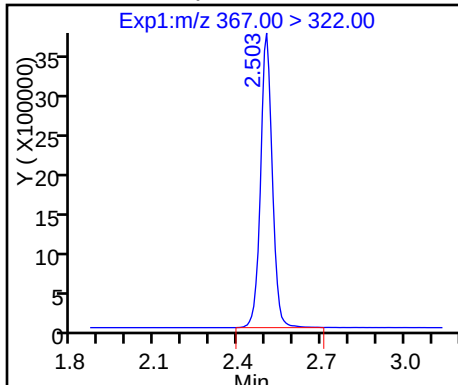
8 Perfluorohexanesulfonic acid (M)



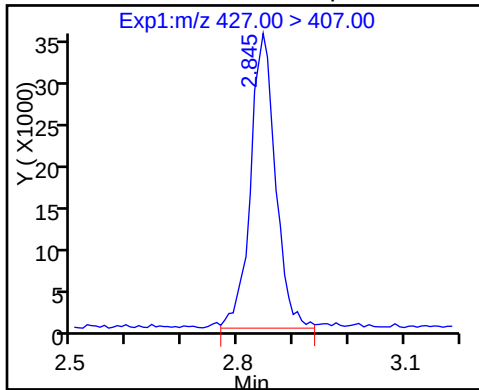
D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

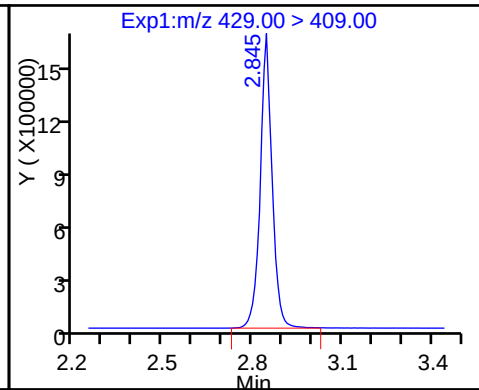
D 11 18O2 PFHxS



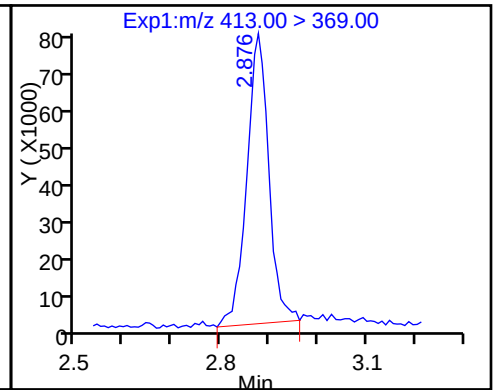
## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS



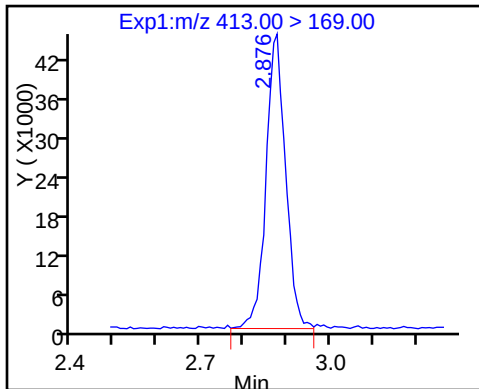
## D 12 M2-6:2FTS



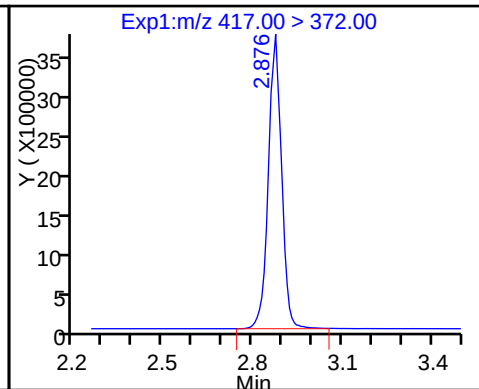
## 15 Perfluorooctanoic acid



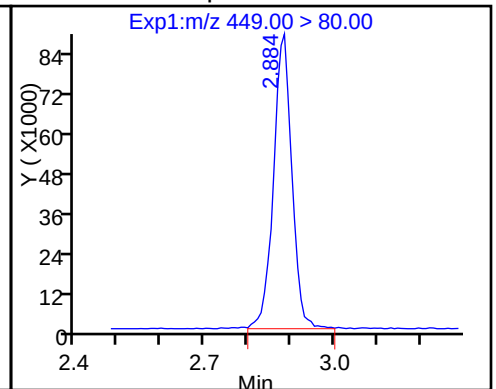
## 15 Perfluorooctanoic acid



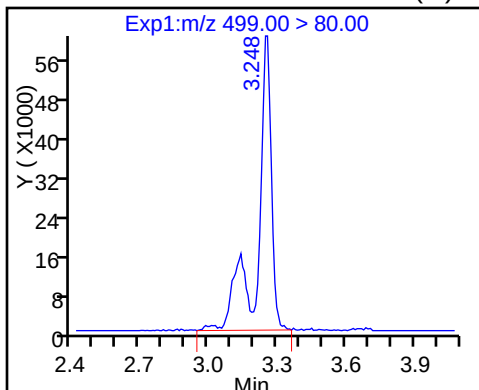
## D 14 13C4 PFOA



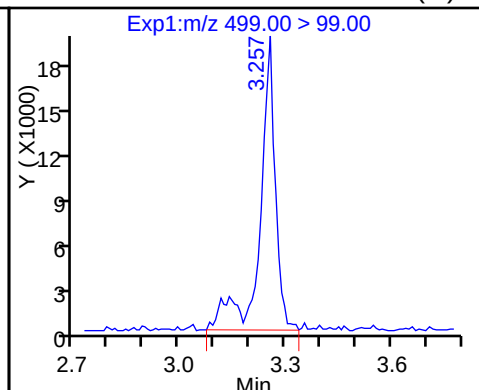
## 16 Perfluoroheptanesulfonic Acid



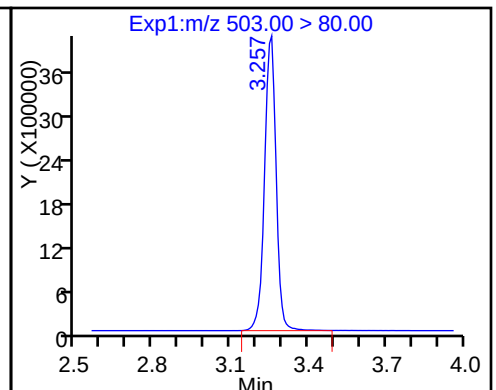
## 17 Perfluorooctane sulfonic acid (M)



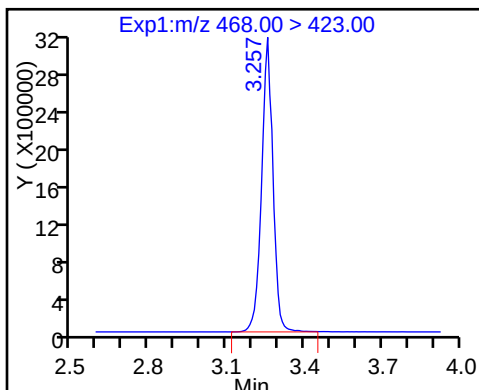
## 17 Perfluorooctane sulfonic acid (M)



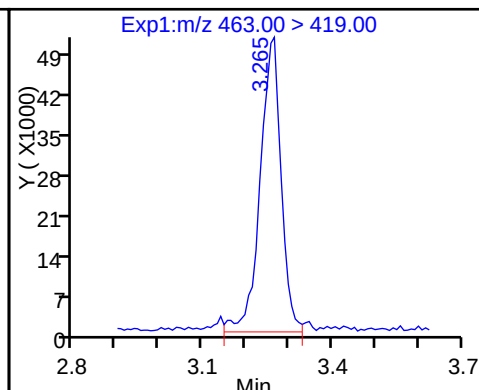
## D 18 13C4 PFOS



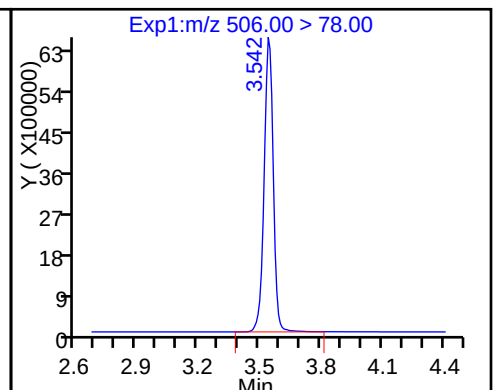
## D 19 13C5 PFNA



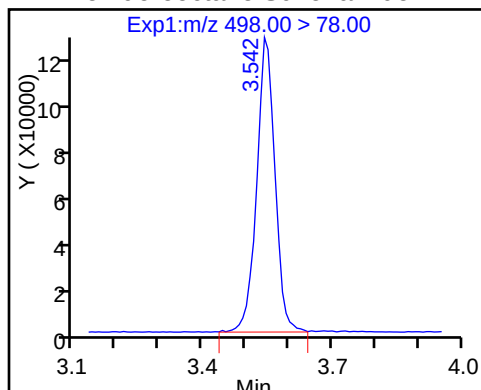
## 20 Perfluorononanoic acid



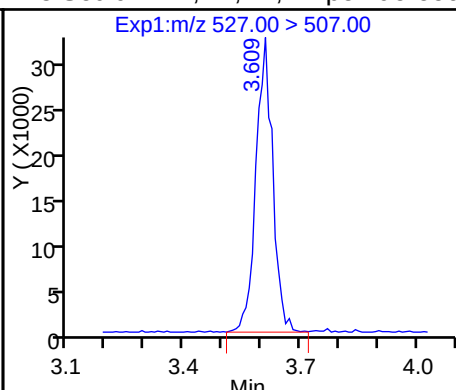
## D 21 13C8 FOSA



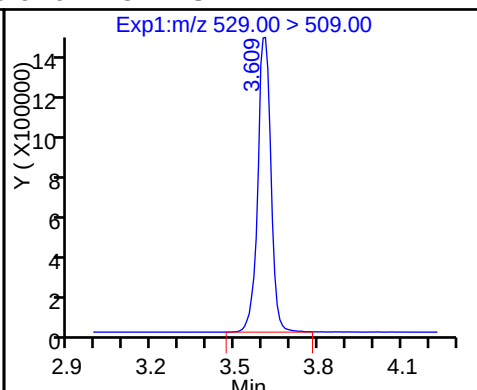
22 Perfluorooctane Sulfonamide



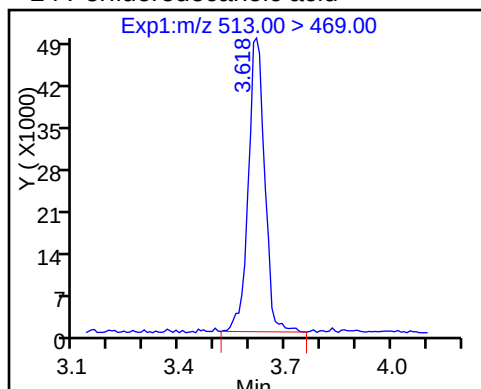
25 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



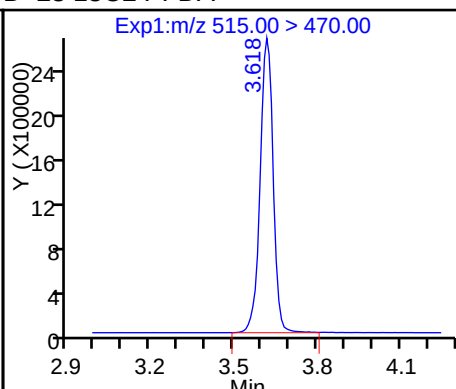
26 M2-8:2FTS



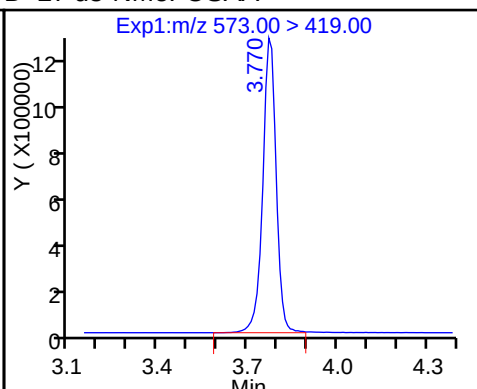
24 Perfluorodecanoic acid



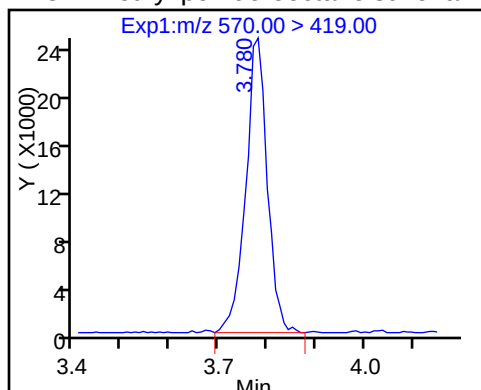
D 23 13C2 PFDA



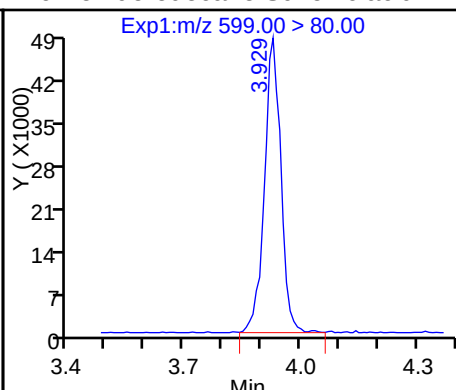
D 27 d3-NMeFOSAA



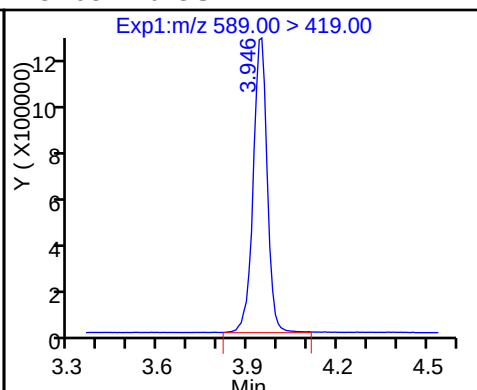
28 N-methyl perfluorooctane sulfonamide



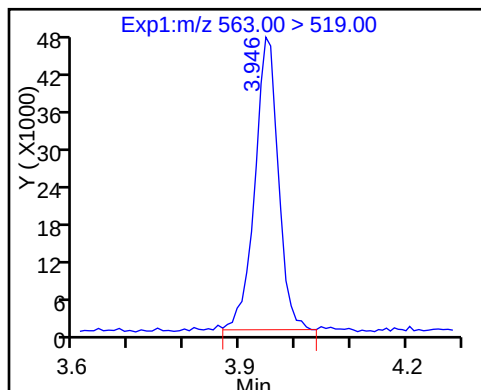
29 Perfluorodecane Sulfonic acid



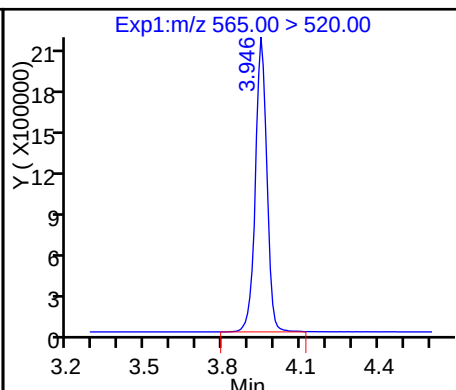
D 32 d5-NEtFOSAA



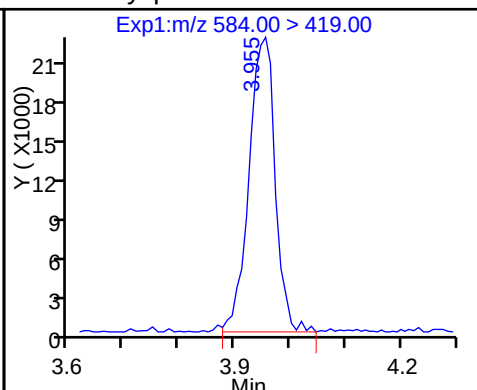
31 Perfluoroundecanoic acid



D 30 13C2 PFUnA



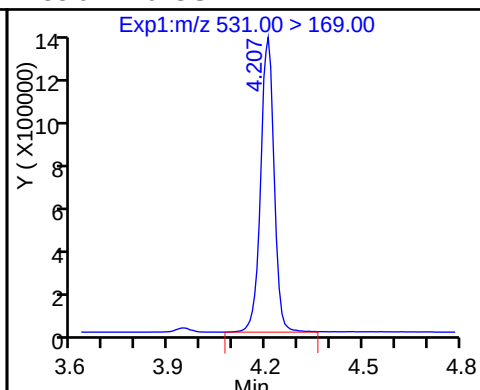
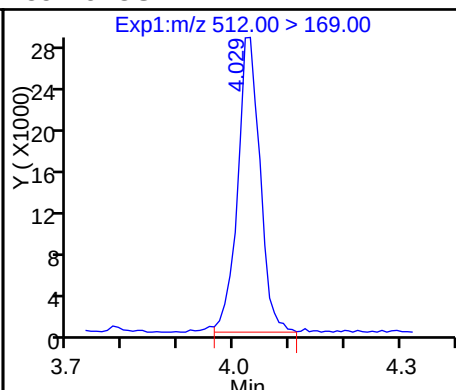
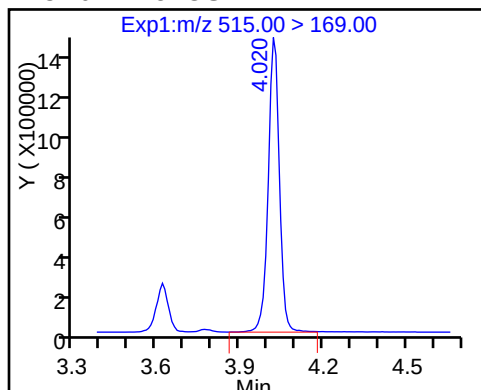
33 N-ethyl perfluorooctane sulfonamide



## D 34 d-N-MeFOSA-M

## 35 MeFOSA

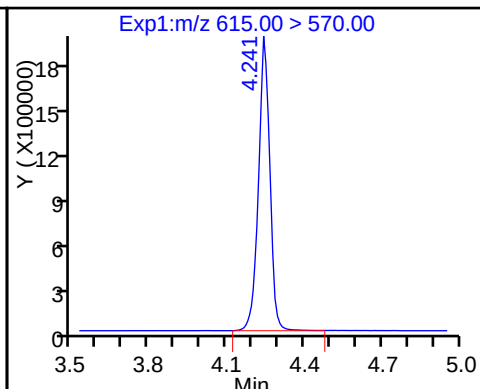
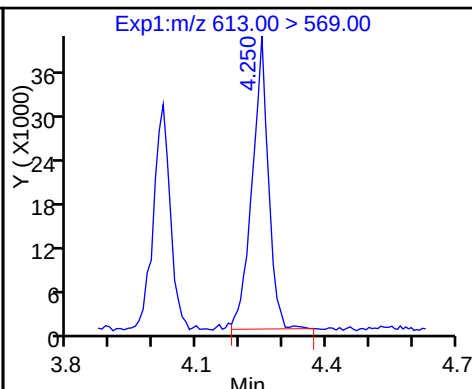
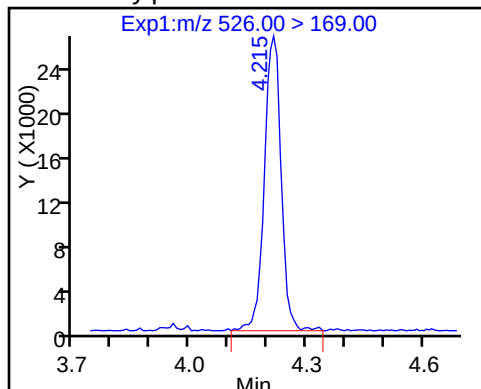
## D 38 d-N-EtFOSA-M



## 39 N-ethylperfluoro-1-octanesulfonami

## 37 Perfluorododecanoic acid

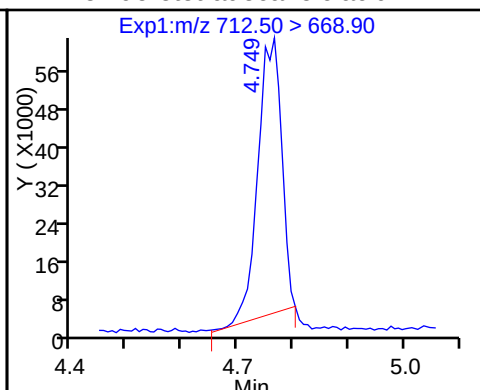
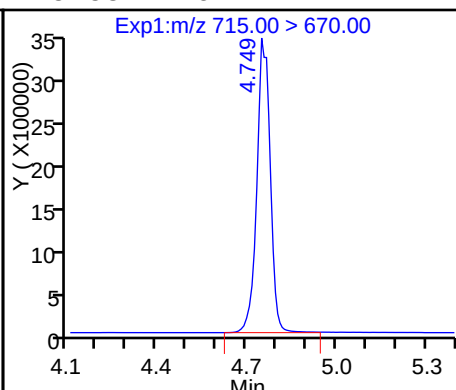
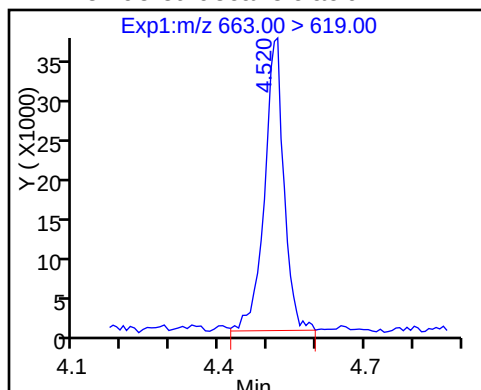
## D 36 13C2 PFDa



## 41 Perfluorotridecanoic acid

## D 43 13C2-PFTeDa

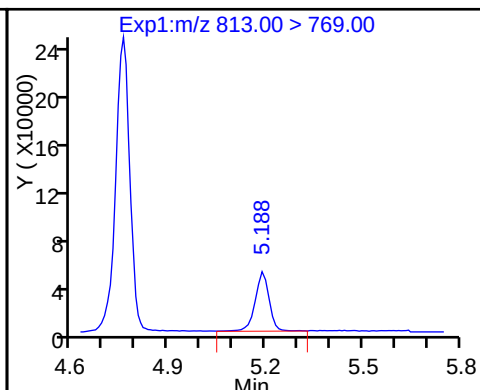
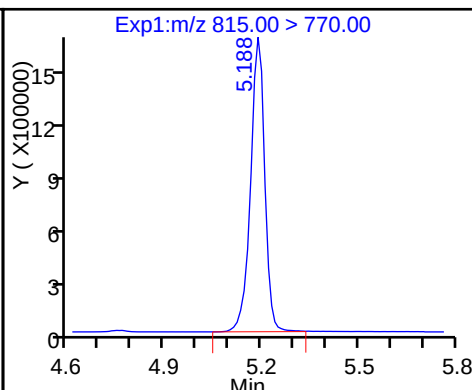
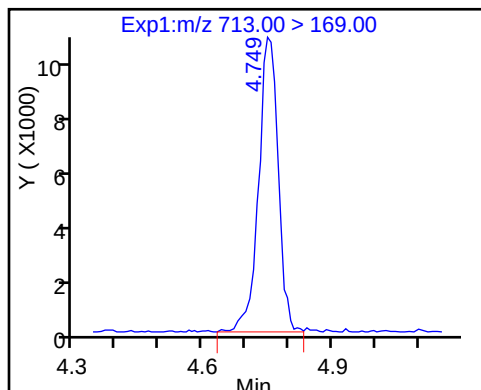
## 42 Perfluorotetradecanoic acid



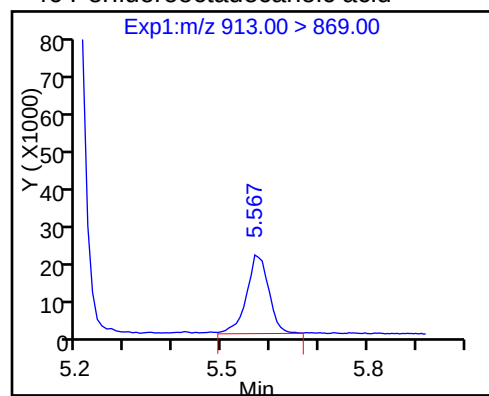
## 42 Perfluorotetradecanoic acid

## D 44 13C2-PFHxDa

## 45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid





## TestAmerica Sacramento

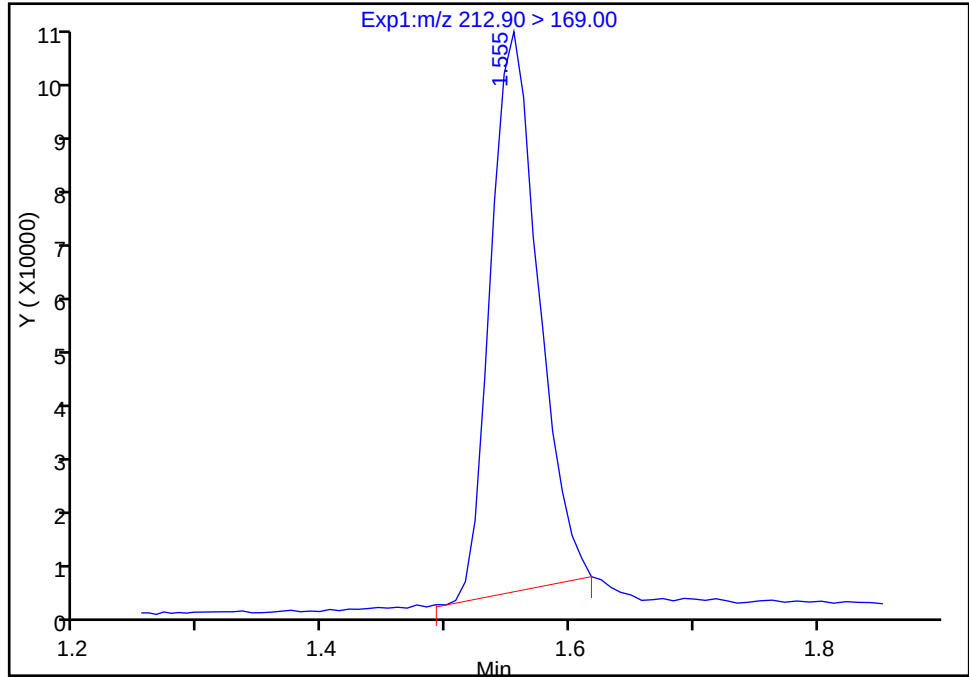
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d  
Injection Date: 11-Mar-2017 12:34:59 Instrument ID: A8\_N  
Lims ID: CCV L2  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 29 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**2 Perfluorobutyric acid, CAS: 375-22-4**

Signal: 1

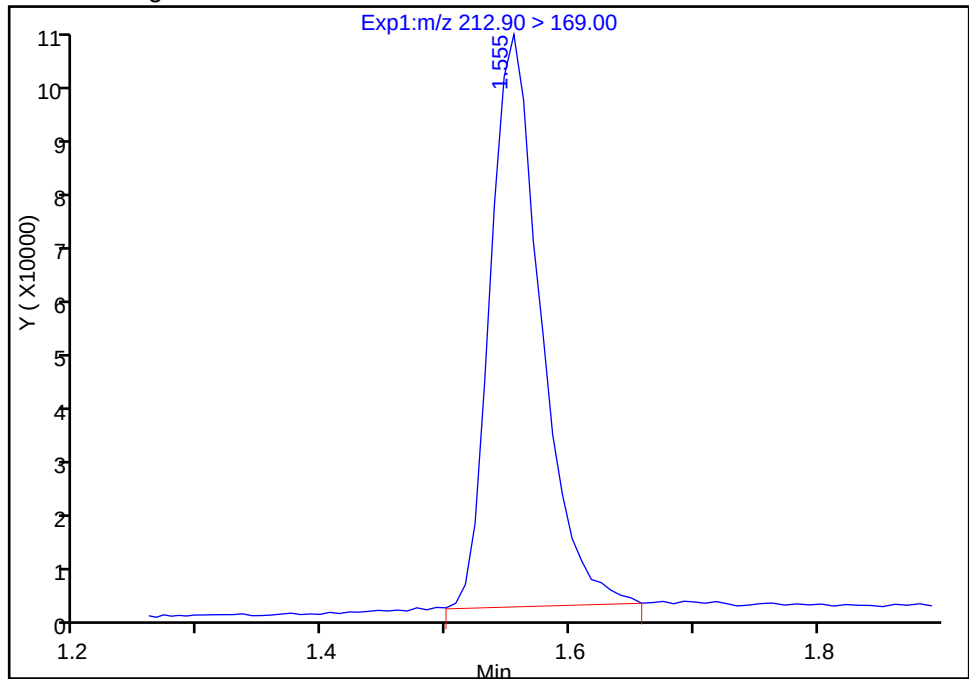
RT: 1.55  
Area: 258682  
Amount: 0.939601  
Amount Units: ng/ml

## Processing Integration Results



RT: 1.55  
Area: 279561  
Amount: 1.015439  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 13-Mar-2017 11:37:42

Audit Action: Manually Integrated

Audit Reason: Baseline

## TestAmerica Sacramento

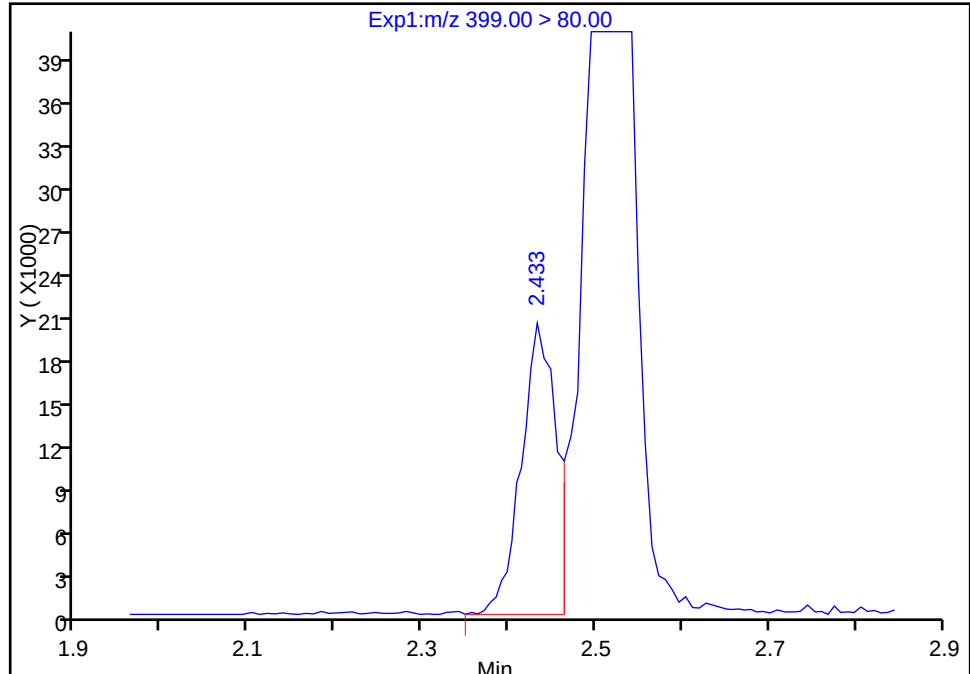
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d  
Injection Date: 11-Mar-2017 12:34:59 Instrument ID: A8\_N  
Lims ID: CCV L2  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 29 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

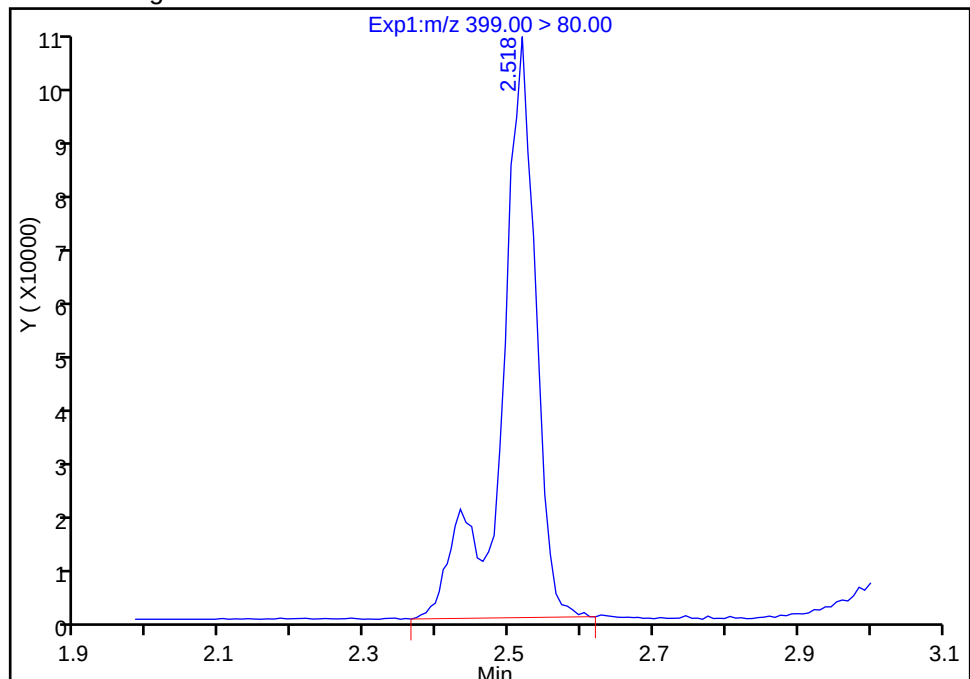
RT: 2.43  
Area: 55666  
Amount: 0.163409  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.52  
Area: 358301  
Amount: 1.051801  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 13-Mar-2017 11:38:11

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

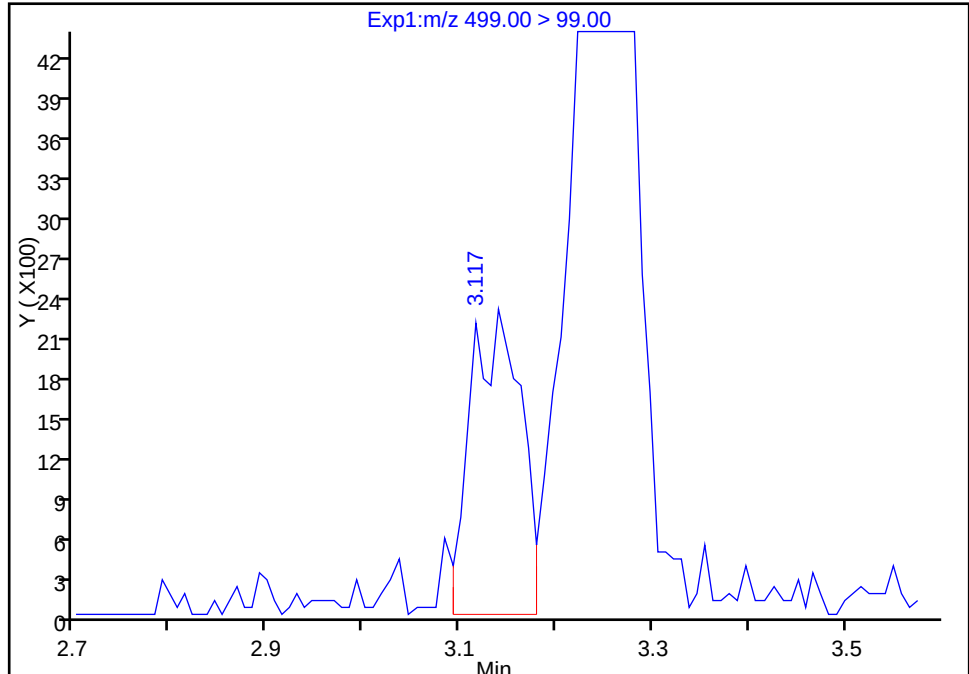
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d  
Injection Date: 11-Mar-2017 12:34:59 Instrument ID: A8\_N  
Lims ID: CCV L2  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 29 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

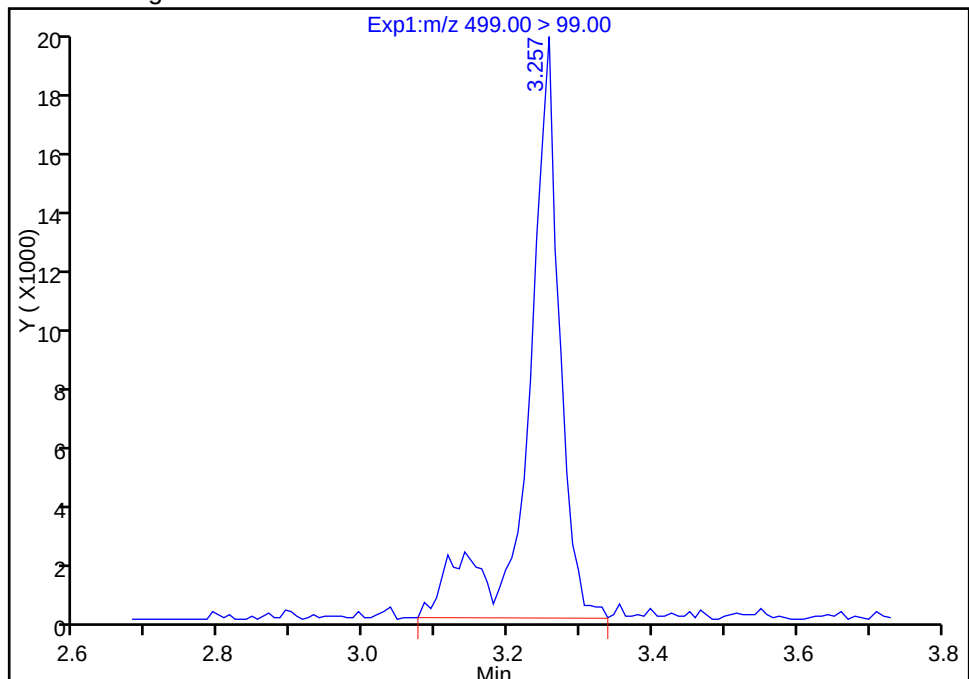
RT: 3.12  
Area: 8120  
Amount: 4980.4771  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.26  
Area: 59515  
Amount: 0.986564  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 13-Mar-2017 11:38:51

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

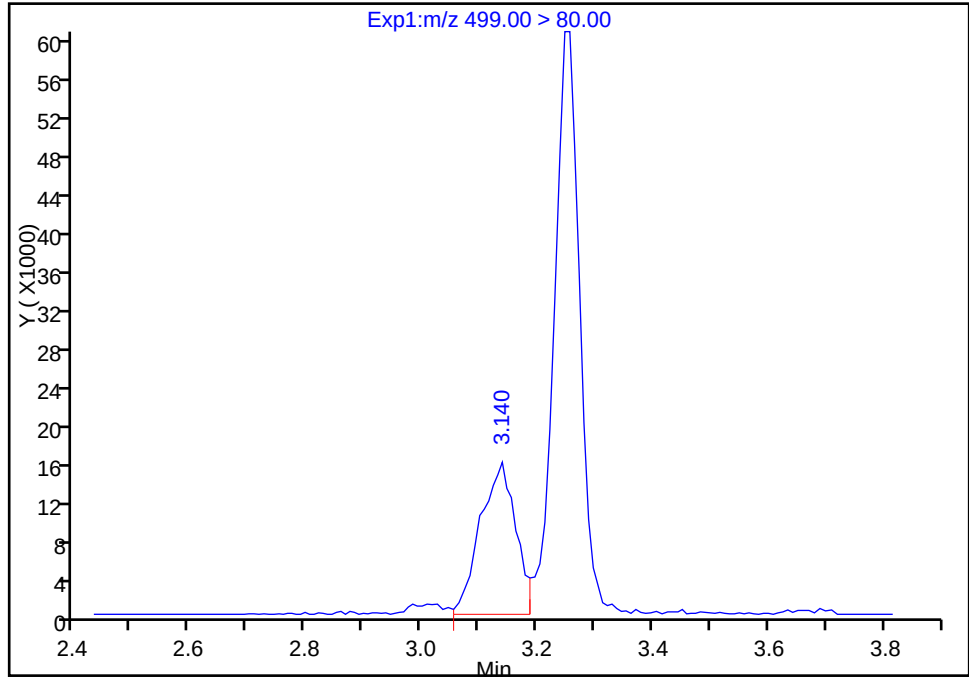
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170311-40737.b\2017.03.11C\_004.d  
Injection Date: 11-Mar-2017 12:34:59 Instrument ID: A8\_N  
Lims ID: CCV L2  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 29 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

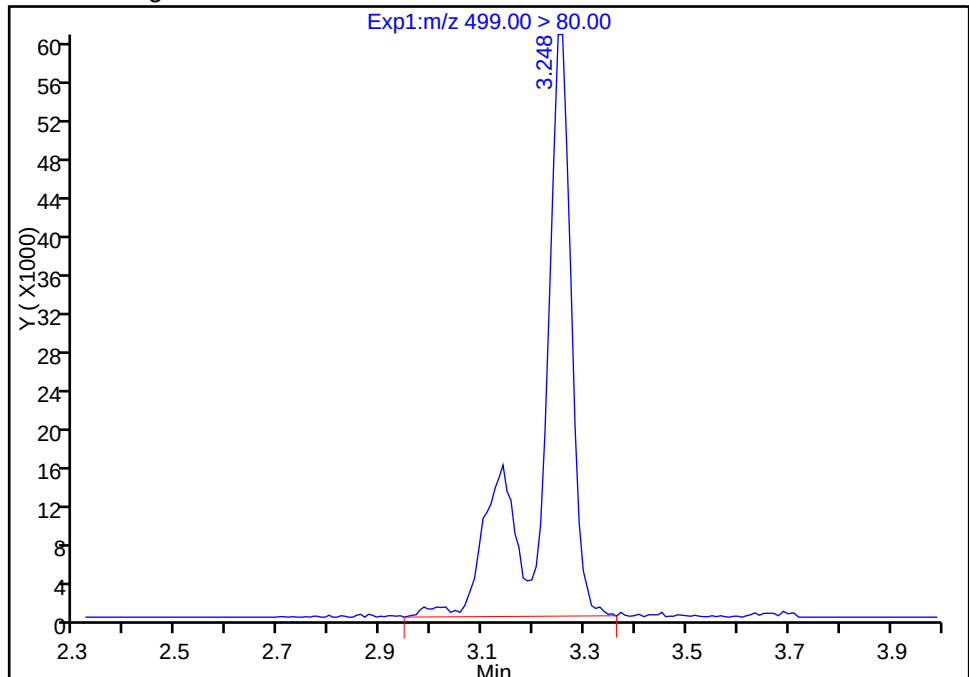
RT: 3.14  
Area: 66505  
Amount: 4980.4771  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.25  
Area: 254636  
Amount: 0.986564  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 13-Mar-2017 11:38:55

Audit Action: Manually Integrated/Assigned Compound ID Audit Reason: Isomers

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: CCV 320-154520/1 Calibration Date: 03/12/2017 03:20

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.11D\_063.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D    | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.8779 |         | 51.8        | 50.0         | 3.6   | 25.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 1.002  |         | 51.2        | 50.0         | 2.4   | 25.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.472  |         | 45.4        | 44.2         | 2.8   | 25.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.9141 |         | 51.4        | 50.0         | 2.8   | 25.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 0.9778 |         | 50.5        | 50.0         | 1.1   | 25.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 1.023  |         | 45.3        | 45.5         | -0.5  | 25.0   |
| 6:2FTS                                                     | L2ID       |         | 0.8946 |         | 47.7        | 47.4         | 0.7   | 25.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 0.9707 |         | 47.5        | 50.0         | -5.0  | 25.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.115  |         | 51.5        | 47.6         | 8.2   | 25.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 0.9380 |         | 51.9        | 50.0         | 3.8   | 25.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 1.037  |         | 48.9        | 46.4         | 5.5   | 25.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.9277 |         | 51.6        | 50.0         | 3.2   | 25.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9186 |         | 47.5        | 47.9         | -0.7  | 25.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.8971 |         | 49.5        | 50.0         | -0.9  | 25.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 0.9280 |         | 47.8        | 50.0         | -4.4  | 25.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.6343 |         | 51.3        | 48.2         | 6.5   | 25.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.8816 |         | 48.4        | 50.0         | -3.2  | 25.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 0.9912 |         | 48.9        | 50.0         | -2.2  | 25.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9066 |         | 48.5        | 50.0         | -3.1  | 25.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.9370 |         | 51.2        | 50.0         | 2.5   | 25.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 0.9351 |         | 47.5        | 50.0         | -4.9  | 25.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.9367 |         | 53.6        | 50.0         | 7.2   | 25.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 1.836  |         | 46.7        | 50.0         | -6.6  | 25.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 0.9465 |         | 50.7        | 50.0         | 1.4   | 25.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.6415 |         | 44.7        | 50.0         | -10.6 | 25.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 319363 |         | 54.6        | 50.0         | 9.3   | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 250189 |         | 53.9        | 50.0         | 7.8   | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 229565 |         | 54.4        | 50.0         | 8.9   | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 206812 |         | 53.6        | 50.0         | 7.2   | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 312891 |         | 50.9        | 47.3         | 7.6   | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 83781  |         | 51.6        | 47.5         | 8.6   | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-154520/1 Calibration Date: 03/12/2017 03:20  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.11D\_063.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D   | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 216440 |        | 52.8           | 50.0            | 5.6  | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 256880 |        | 50.8           | 47.8            | 6.3  | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 183176 |        | 51.5           | 50.0            | 3.0  | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 375105 |        | 51.1           | 50.0            | 2.2  | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 98354  |        | 50.9           | 47.9            | 6.2  | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 170706 |        | 51.2           | 50.0            | 2.4  | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 87521  |        | 51.4           | 50.0            | 2.7  | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 125401 |        | 47.9           | 50.0            | -4.1 | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 81568  |        | 50.1           | 50.0            | 0.2  | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 84741  |        | 48.2           | 50.0            | -3.7 | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 118027 |        | 47.6           | 50.0            | -4.8 | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 78700  |        | 46.2           | 50.0            | -7.7 | 50.0      |
| 13C2-PFTEdA  | Ave           | 259165 | 247728 |        | 47.8           | 50.0            | -4.4 | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 130728 |        | 52.3           | 50.0            | 4.5  | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCV  
 Inject. Date: 12-Mar-2017 03:20:35 ALS Bottle#: 32 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub14  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 10:57:16 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 10:57:15

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.538 | 1.538  | 0.0    |        | 15968132 | 54.6         |                 | 109  | 824733 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                       | 1.538 | 1.538  | 0.0    | 1.000  | 14017800 | 51.8         |                 | 104  | 92145  |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.822 | 1.822  | 0.0    |        | 12509428 | 53.9         |                 | 108  | 734935 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.822 | 1.822  | 0.0    | 1.000  | 12539903 | 51.2         |                 | 102  | 150710 |       |
| D 47 13C3-PFBS                        |       |        |        |        |          |              |                 |      |        |       |
| 301.90 > 83.00                        | 1.851 | 1.851  | 0.0    |        | 313857   | NC           |                 |      |        |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.861 | 1.861  | 0.0    | 1.000  | 20358701 | 45.4         |                 | 103  |        |       |
| 298.90 > 99.00                        | 1.851 | 1.861  | -0.010 | 0.995  | 8923025  |              | 2.28(0.00-0.00) |      |        |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                       | 2.108 | 2.108  | 0.0    | 1.000  | 10491702 | 51.4         |                 | 103  | 310156 |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.116 | 2.116  | 0.0    |        | 11478235 | 54.4         |                 | 109  | 530352 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 399.00 > 80.00                        | 2.463 | 2.463  | 0.0    | 1.000  | 14567938 | 45.3         |                 | 99.5 |        | M     |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                       | 2.447 | 2.447  | 0.0    | 1.000  | 10111469 | 50.5         |                 | 101  | 96104  |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.447 | 2.447  | 0.0    |        | 10340596 | 53.6         |                 | 107  | 333847 |       |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.463 | 2.463  | 0.0    |        | 14799722 | 50.9         |                 | 108  | 345679 |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.781 | 2.781  | 0.0    | 1.000  | 3552523  | 47.7         |                 | 101  |        |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 12 M2-6:2FTS                        |       |           |           |           |          |                 |                 |      |        |       |
| 429.00 > 409.00                       | 2.781 | 2.781     | 0.0       |           | 3979618  | 51.6            |                 | 109  |        |       |
| 15 Perfluorooctanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 413.00 > 369.00                       | 2.812 | 2.812     | 0.0       | 1.000     | 10504688 | 47.5            |                 | 95.0 | 98240  |       |
| 413.00 > 169.00                       | 2.812 | 2.812     | 0.0       | 1.000     | 6290338  |                 | 1.67(0.90-1.10) |      | 157139 |       |
| D 14 13C4 PFOA                        |       |           |           |           |          |                 |                 |      |        |       |
| 417.00 > 372.00                       | 2.812 | 2.812     | 0.0       |           | 10822009 | 52.8            |                 | 106  | 299249 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |           |           |           |          |                 |                 |      |        |       |
| 449.00 > 80.00                        | 2.820 | 2.820     | 0.0       | 1.000     | 13638540 | 51.5            |                 | 108  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 499.00 > 80.00                        | 3.186 | 3.186     | 0.0       | 1.000     | 12361932 | 48.9            |                 | 105  | 316267 | M     |
| 499.00 > 99.00                        | 3.186 | 3.186     | 0.0       | 1.000     | 2787304  |                 | 4.44(0.90-1.10) |      | 126094 | M     |
| D 18 13C4 PFOS                        |       |           |           |           |          |                 |                 |      |        |       |
| 503.00 > 80.00                        | 3.194 | 3.178     | 0.016     |           | 12278847 | 50.8            |                 | 106  | 166072 | M     |
| 20 Perfluorononanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 463.00 > 419.00                       | 3.186 | 3.186     | 0.0       | 1.000     | 8591138  | 51.9            |                 | 104  | 117706 |       |
| D 19 13C5 PFNA                        |       |           |           |           |          |                 |                 |      |        |       |
| 468.00 > 423.00                       | 3.194 | 3.194     | 0.0       |           | 9158790  | 51.5            |                 | 103  | 223137 |       |
| D 21 13C8 FOSA                        |       |           |           |           |          |                 |                 |      |        |       |
| 506.00 > 78.00                        | 3.520 | 3.520     | 0.0       |           | 18755251 | 51.1            |                 | 102  | 407667 |       |
| 22 Perfluorooctane Sulfonamide        |       |           |           |           |          |                 |                 |      |        |       |
| 498.00 > 78.00                        | 3.528 | 3.528     | 0.0       | 1.000     | 17399259 | 51.6            |                 | 103  | 317613 |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |           |           |           |          |                 |                 |      |        |       |
| 527.00 > 507.00                       | 3.537 | 3.537     | 0.0       | 1.000     | 4327850  | 47.5            |                 | 99.3 |        |       |
| D 26 M2-8:2FTS                        |       |           |           |           |          |                 |                 |      |        |       |
| 529.00 > 509.00                       | 3.537 | 3.537     | 0.0       |           | 4711136  | 50.9            |                 | 106  |        |       |
| 24 Perfluorodecanoic acid             |       |           |           |           |          |                 |                 |      |        |       |
| 513.00 > 469.00                       | 3.545 | 3.545     | 0.0       | 1.000     | 7657143  | 49.5            |                 | 99.1 | 208148 |       |
| D 23 13C2 PFDA                        |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 470.00                       | 3.554 | 3.554     | 0.0       |           | 8535299  | 51.2            |                 | 102  | 158332 |       |
| D 27 d3-NMeFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 573.00 > 419.00                       | 3.693 | 3.693     | 0.0       |           | 4376036  | 51.4            |                 | 103  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 570.00 > 419.00                       | 3.704 | 3.704     | 0.0       | 1.003     | 4060758  | 47.8            |                 | 95.6 |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |           |           |           |          |                 |                 |      |        |       |
| 599.00 > 80.00                        | 3.850 | 3.850     | 0.0       | 1.000     | 7853261  | 51.3            |                 | 106  |        |       |
| D 30 13C2 PFUnA                       |       |           |           |           |          |                 |                 |      |        |       |
| 565.00 > 520.00                       | 3.867 | 3.867     | 0.0       |           | 6270043  | 47.9            |                 | 95.9 | 195829 |       |
| D 32 d5-NEtFOSAA                      |       |           |           |           |          |                 |                 |      |        |       |
| 589.00 > 419.00                       | 3.867 | 3.867     | 0.0       |           | 4078391  | 50.1            |                 | 100  |        |       |
| 31 Perfluoroundecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 563.00 > 519.00                       | 3.876 | 3.876     | 0.0       | 1.000     | 6214551  | 48.9            |                 | 97.8 | 138561 |       |
| 35 MeFOSA                             |       |           |           |           |          |                 |                 |      |        |       |
| 512.00 > 169.00                       | 4.019 | 4.019     | 0.0       | 1.000     | 3841341  | 48.5            |                 | 96.9 |        |       |
| D 34 d-N-MeFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 515.00 > 169.00                       | 4.019 | 4.019     | 0.0       |           | 4237029  | 48.2            |                 | 96.3 |        |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |           |           |           |          |                 |                 |      |        |       |
| 584.00 > 419.00                       | 3.876 | 3.876     | 0.0       | 1.002     | 3595530  | 48.4            |                 | 96.8 |        |       |



| Signal                                | RT              | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-----------------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| 37 Perfluorododecanoic acid           | 613.00 > 569.00 | 4.159     | 4.159     | 0.0       | 1.000    | 5529279         | 51.2            | 102  | 51961  |       |
| D 36 13C2 PFDaA                       | 615.00 > 570.00 | 4.166     | 4.166     | 0.0       |          | 5901360         | 47.6            | 95.2 | 128376 |       |
| D 38 d-N-EtFOSA-M                     | 531.00 > 169.00 | 4.202     | 4.202     | 0.0       |          | 3935001         | 46.2            | 92.3 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami | 526.00 > 169.00 | 4.210     | 4.210     | 0.0       | 1.000    | 3679527         | 47.5            | 95.1 |        |       |
| 41 Perfluorotridecanoic acid          | 663.00 > 619.00 | 4.421     | 4.421     | 0.0       | 1.000    | 5528041         | 53.6            | 107  | 100876 |       |
| 42 Perfluorotetradecanoic acid        | 712.50 > 668.90 | 4.658     | 4.658     | 0.0       | 1.000    | 10835269        | 46.7            | 93.4 | 101870 |       |
|                                       | 713.00 > 169.00 | 4.658     | 4.658     | 0.0       | 1.000    | 1541930         | 7.03(0.00-0.00) |      | 100350 |       |
| D 43 13C2-PFTeDA                      | 715.00 > 670.00 | 4.658     | 4.658     | 0.0       |          | 12386383        | 47.8            | 95.6 | 302125 |       |
| D 44 13C2-PFHxDA                      | 815.00 > 770.00 | 5.072     | 5.072     | 0.0       |          | 6536398         | 52.3            | 105  | 91851  |       |
| 45 Perfluorohexadecanoic acid         | 813.00 > 769.00 | 5.072     | 5.072     | 0.0       | 1.000    | 5585855         | 50.7            | 101  | 5232   |       |
| 46 Perfluorooctadecanoic acid         | 913.00 > 869.00 | 5.423     | 5.423     | 0.0       | 1.000    | 3785578         | 44.7            | 89.4 | 4383   |       |

**QC Flag Legend**

## Processing Flags

NC - Not Calibrated

## Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L5\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d

Injection Date: 12-Mar-2017 03:20:35

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 32

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

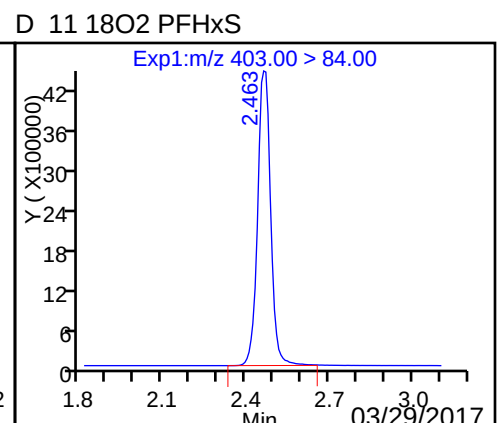
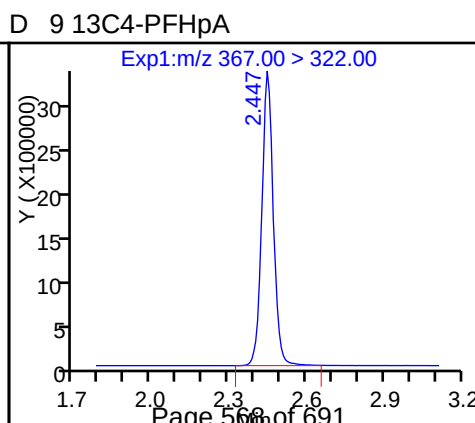
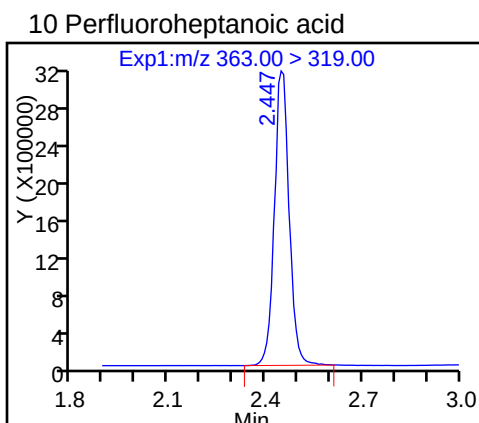
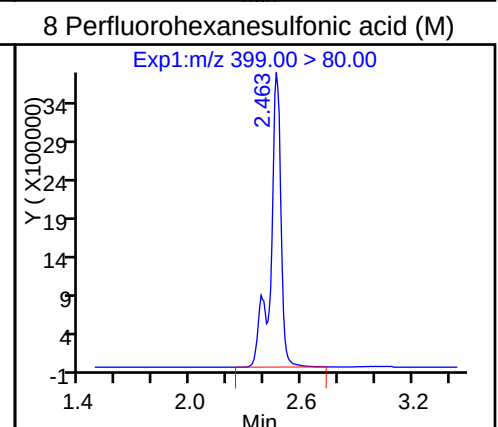
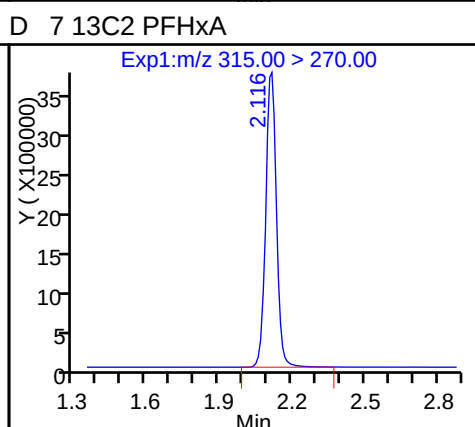
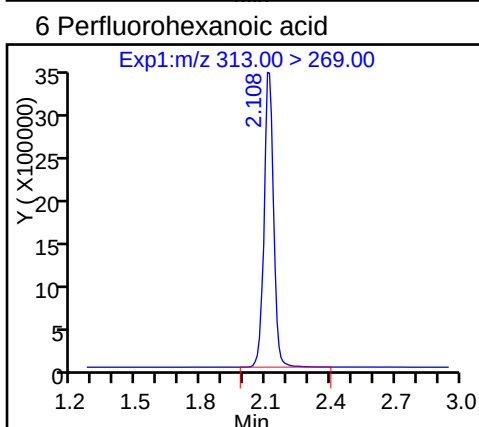
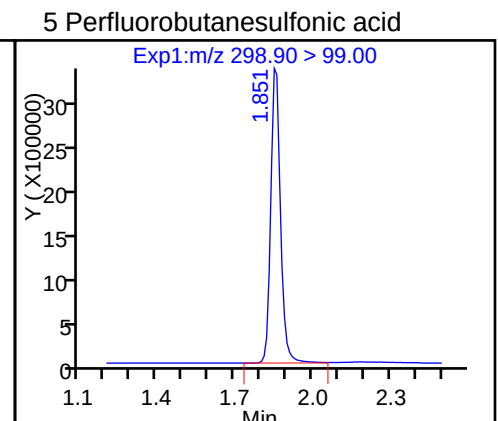
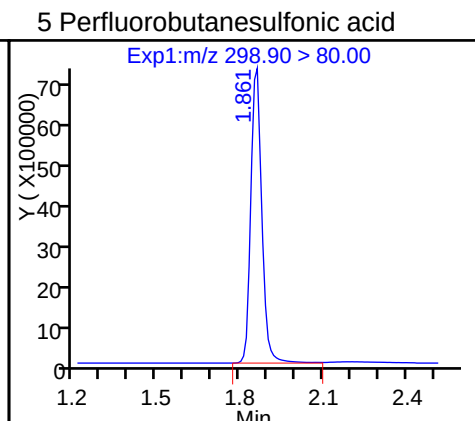
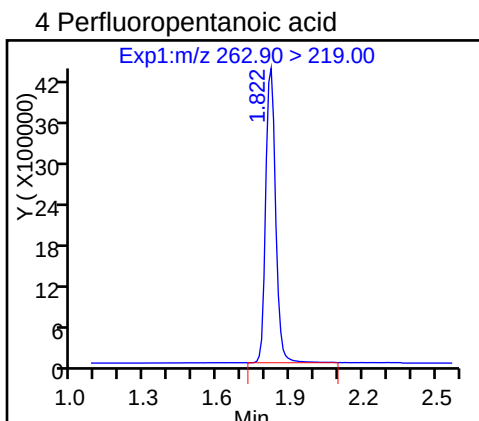
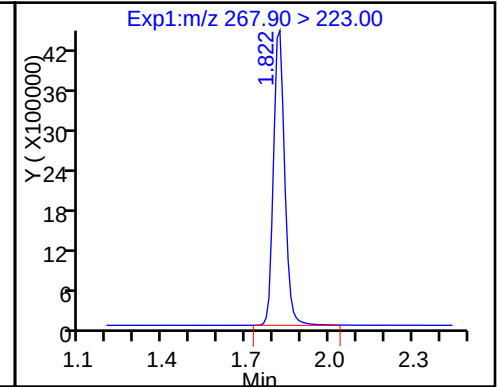
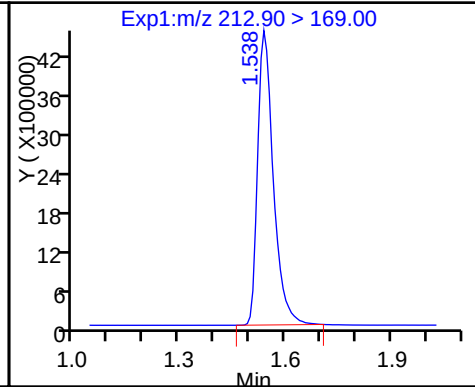
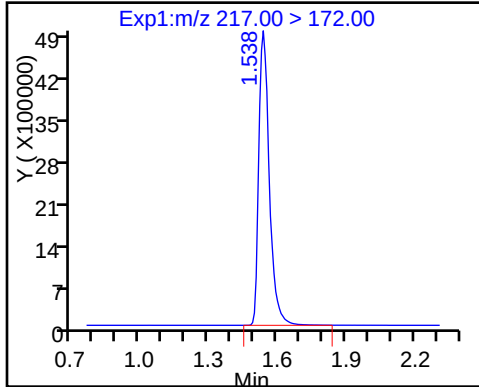
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

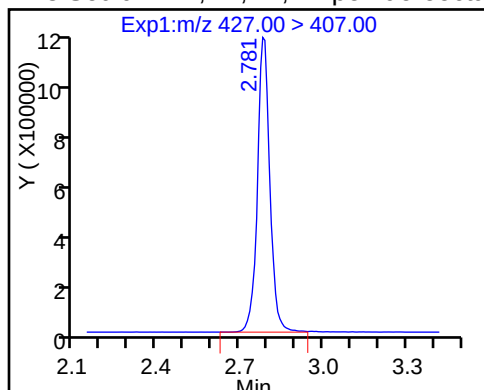
D 1 13C4 PFBA

2 Perfluorobutyric acid

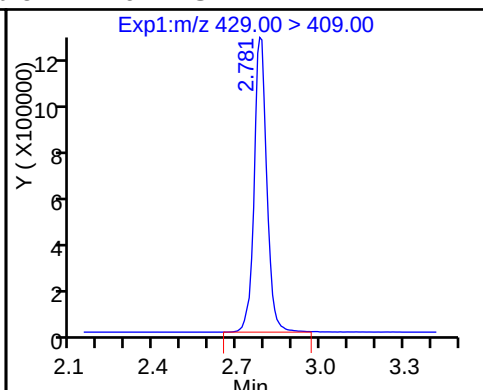
D 3 13C5-PFPeA



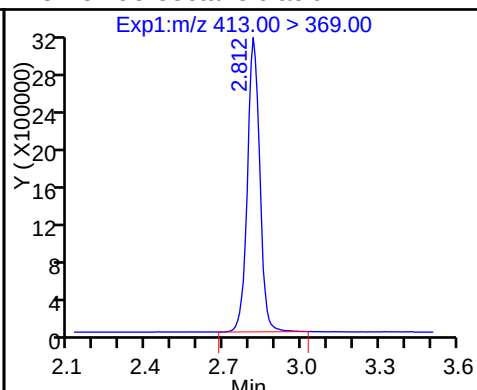
## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS



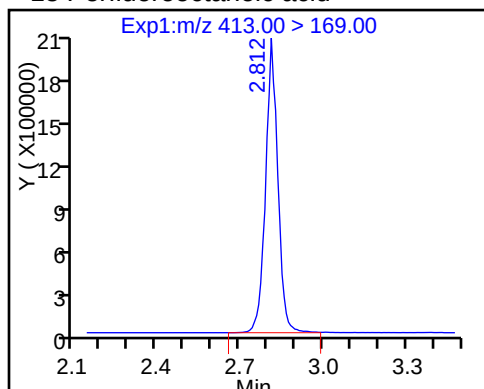
## D 12 M2-6:2FTS



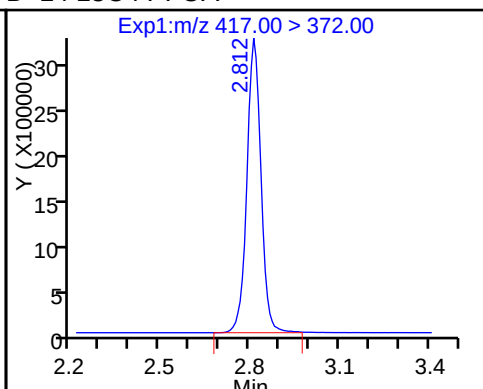
## 15 Perfluorooctanoic acid



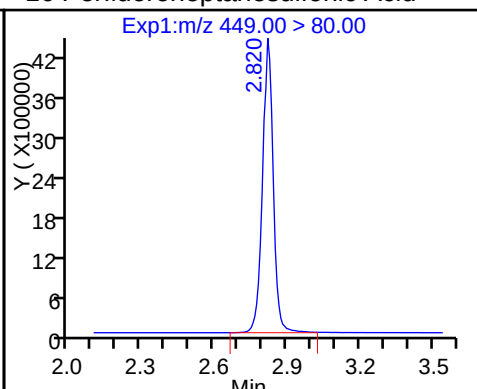
## 15 Perfluorooctanoic acid



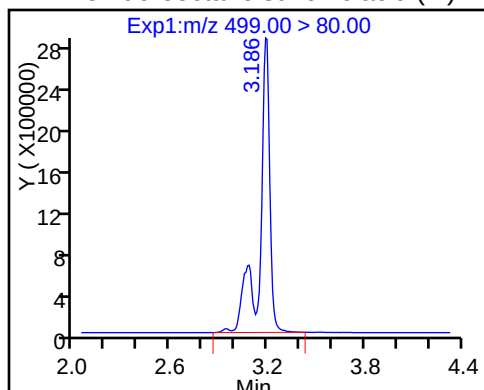
## D 14 13C4 PFOA



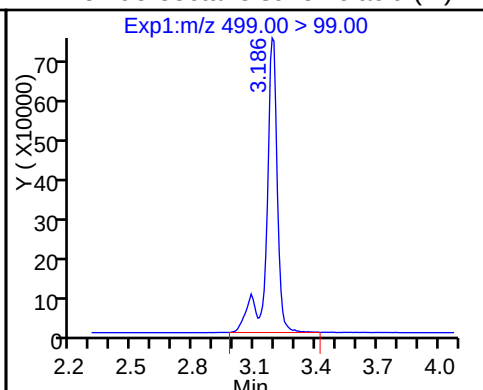
## 16 Perfluoroheptanesulfonic Acid



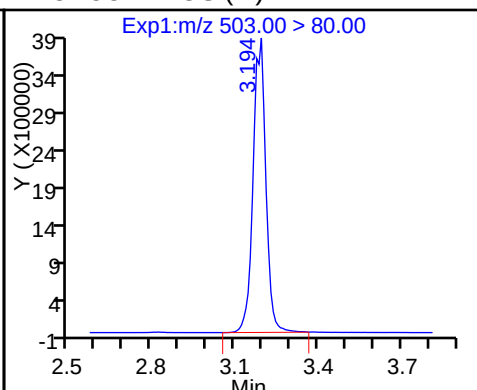
## 17 Perfluorooctane sulfonic acid (M)



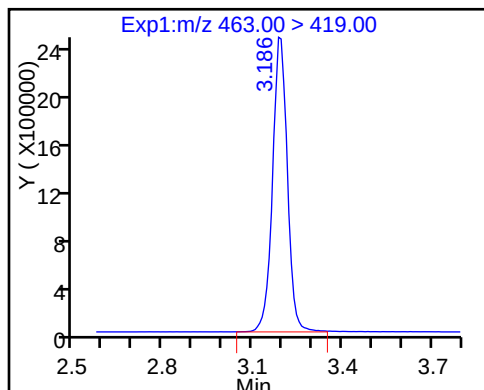
## 17 Perfluorooctane sulfonic acid (M)



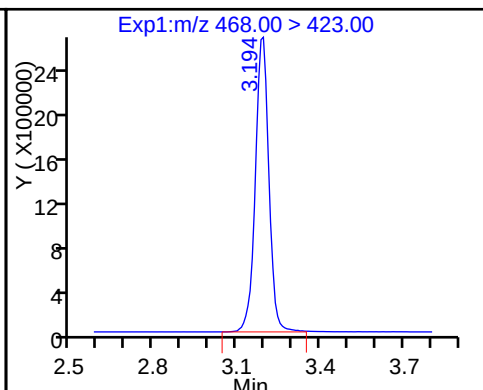
## D 18 13C4 PFOS (M)



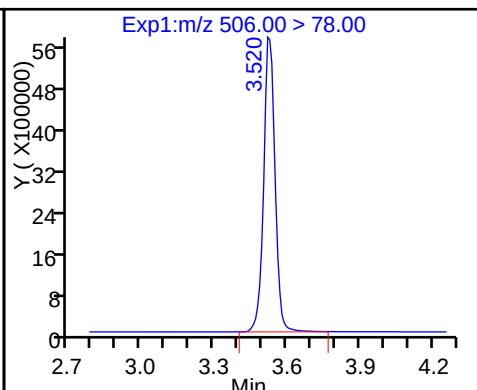
## 20 Perfluorononanoic acid



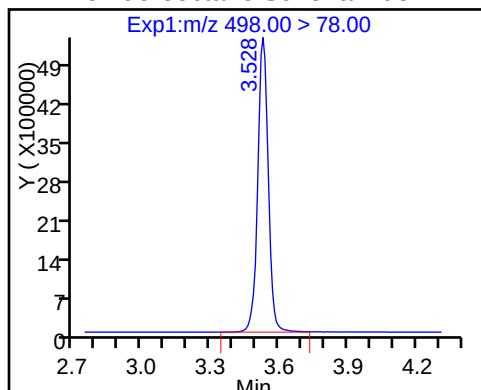
## D 19 13C5 PFNA



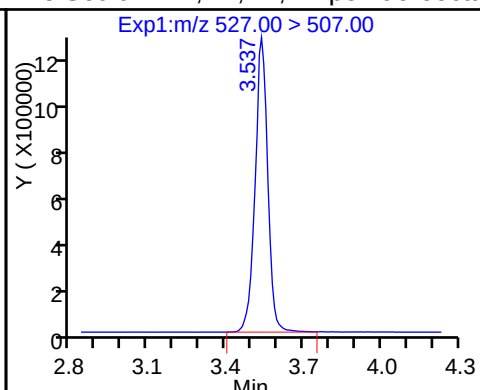
## D 21 13C8 FOSA



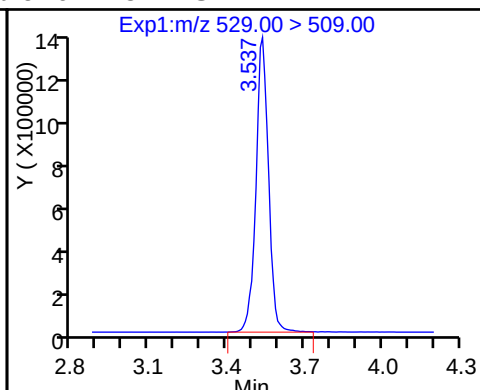
22 Perfluorooctane Sulfonamide



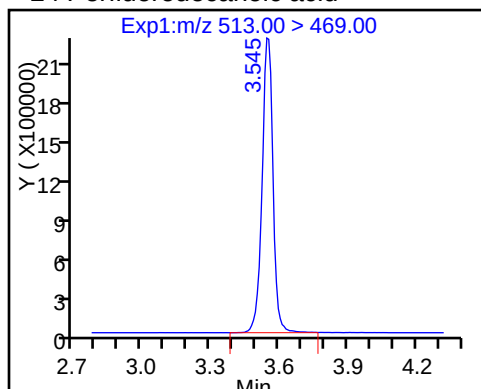
25 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



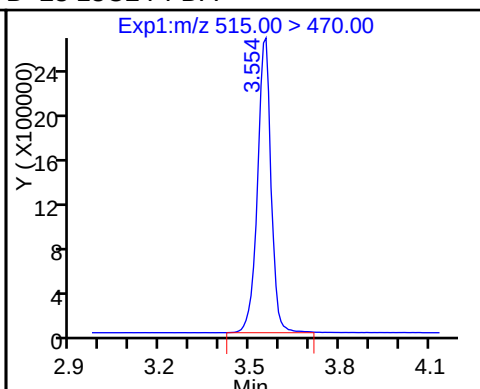
26 M2-8:2FTS



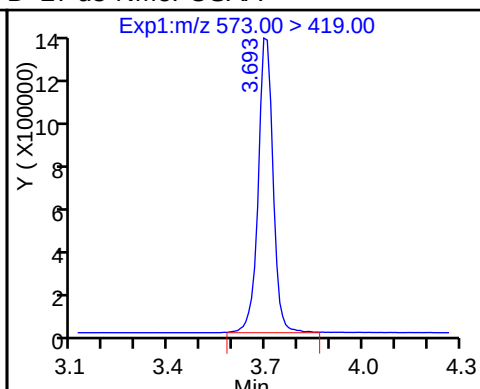
24 Perfluorodecanoic acid



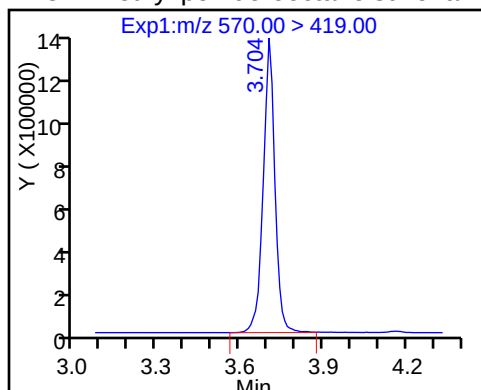
D 23 13C2 PFDA



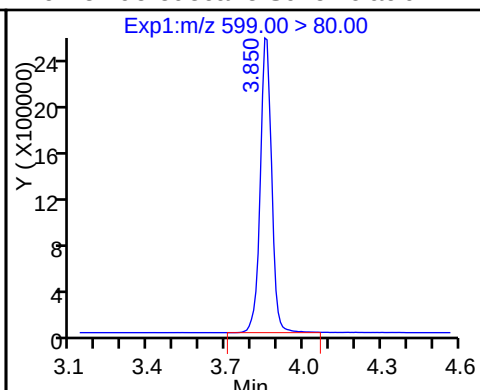
D 27 d3-NMeFOSAA



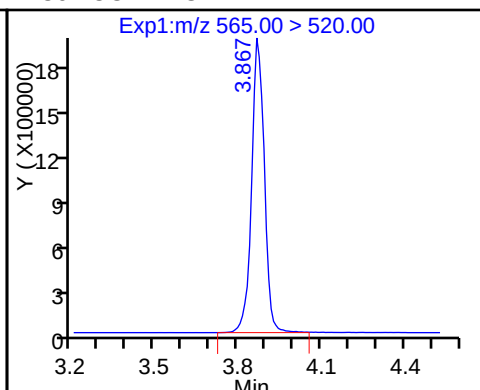
28 N-methyl perfluorooctane sulfonamide



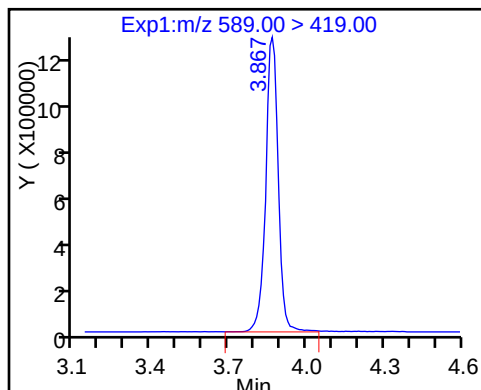
29 Perfluorodecane Sulfonic acid



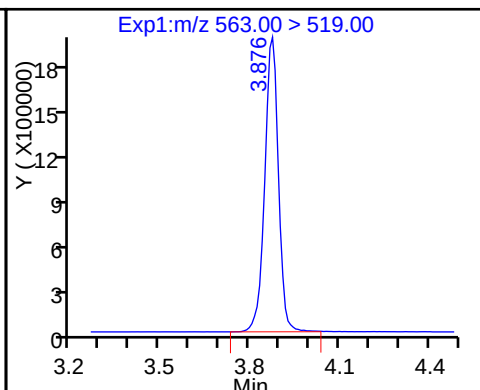
D 30 13C2 PFUnA



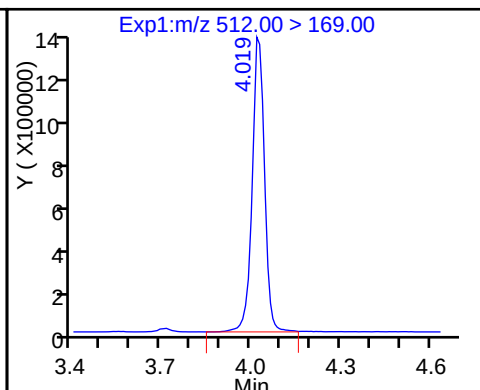
D 32 d5-NEtFOSAA



31 Perfluoroundecanoic acid



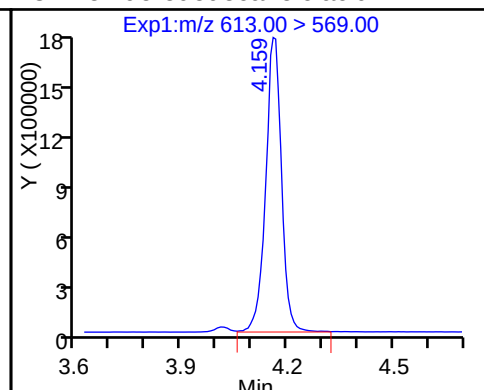
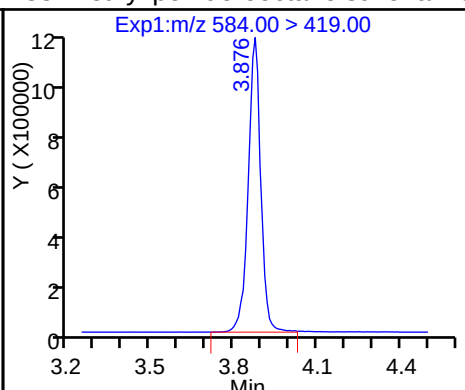
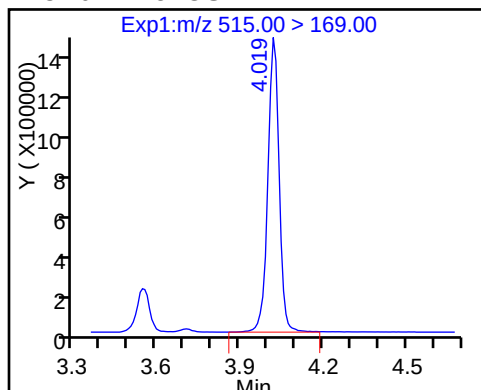
35 MeFOSA



## D 34 d-N-MeFOSA-M

## 33 N-ethyl perfluorooctane sulfonamid

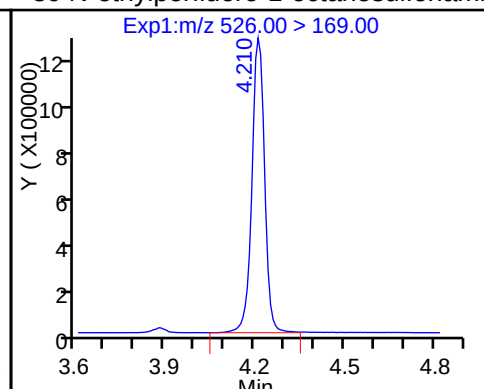
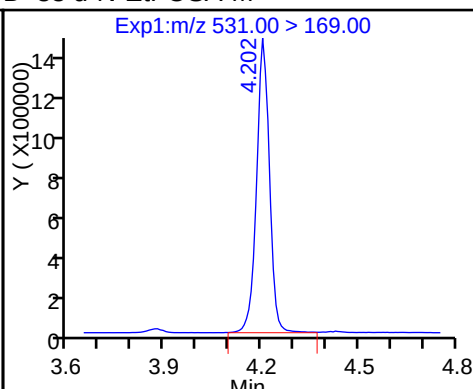
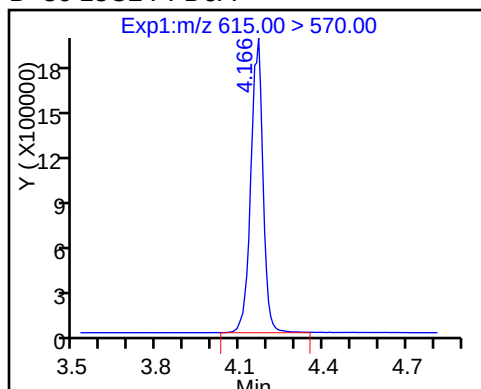
## 37 Perfluorododecanoic acid



## D 36 13C2 PFDa

## D 38 d-N-EtFOSA-M

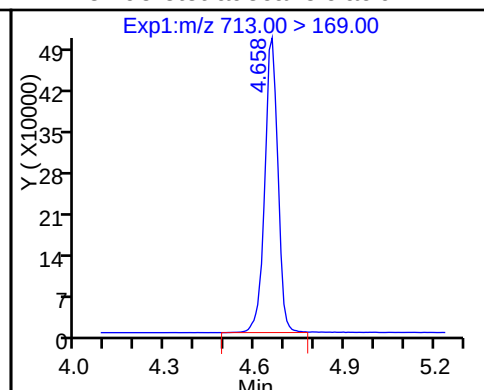
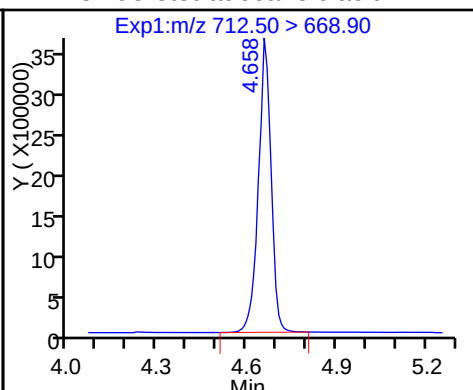
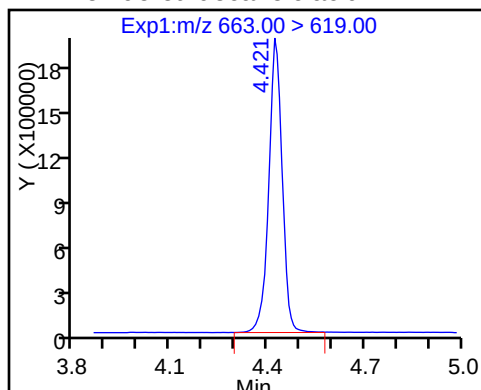
## 39 N-ethylperfluoro-1-octanesulfonami



## 41 Perfluorotridecanoic acid

## 42 Perfluorotetradecanoic acid

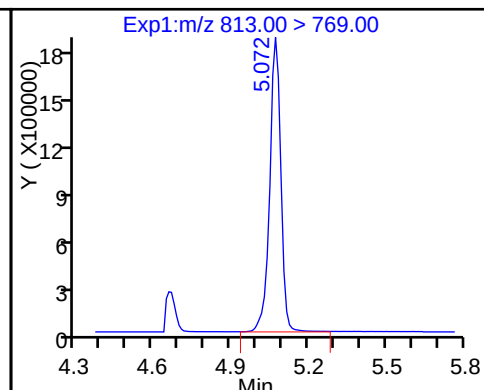
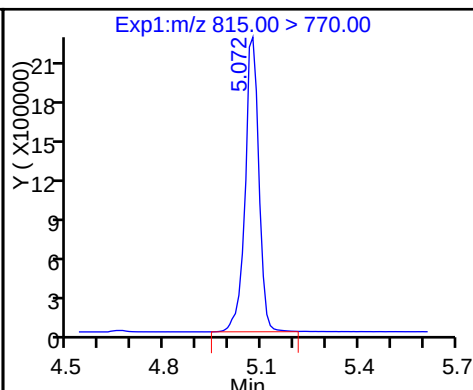
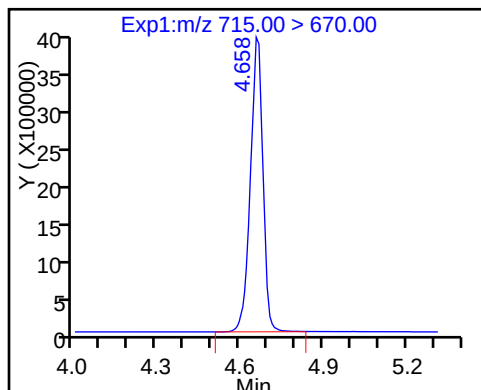
## 42 Perfluorotetradecanoic acid



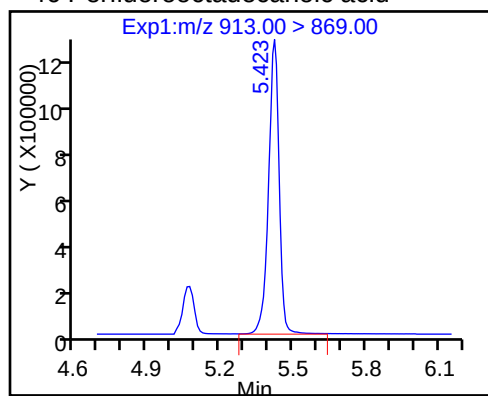
## D 43 13C2-PFTeDa

## D 44 13C2-PFHxDA

## 45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

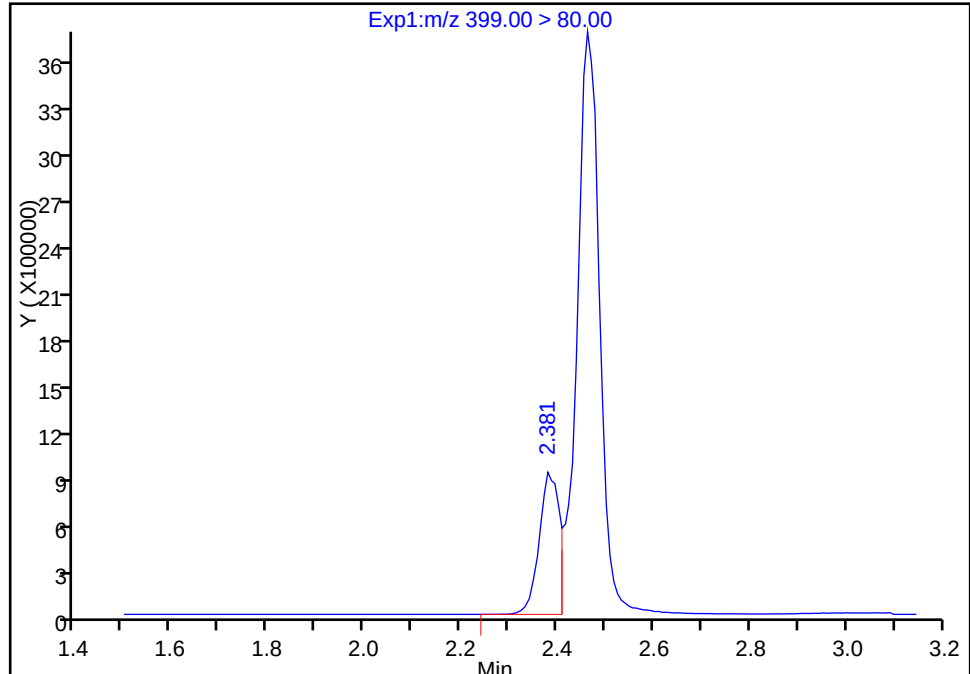
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
Injection Date: 12-Mar-2017 03:20:35 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

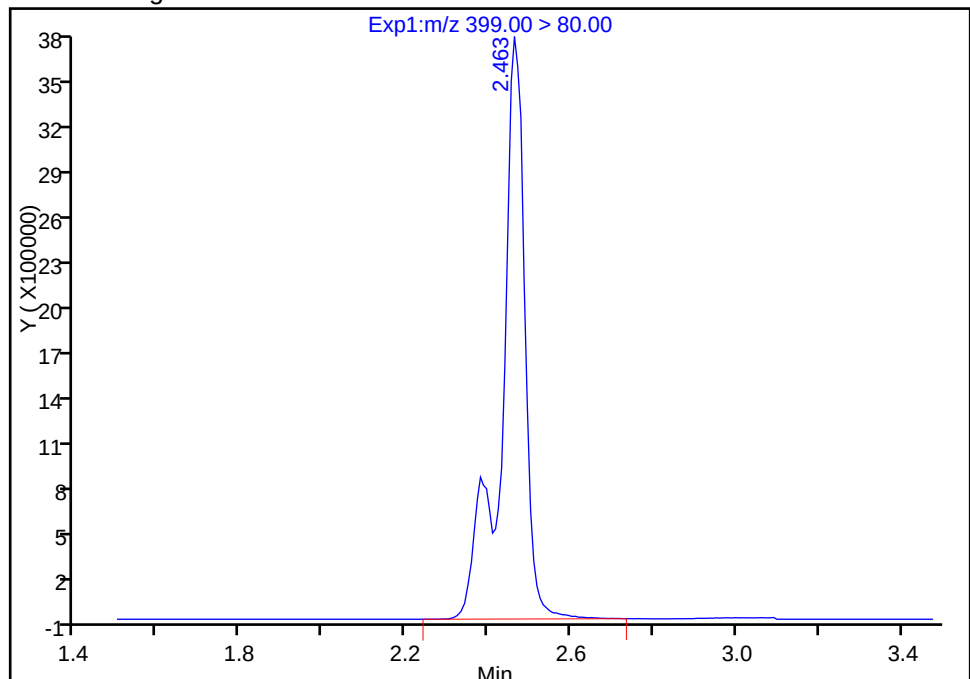
RT: 2.38  
Area: 2528972  
Amount: 7.859071  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.46  
Area: 14567938  
Amount: 45.271538  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:52:57

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

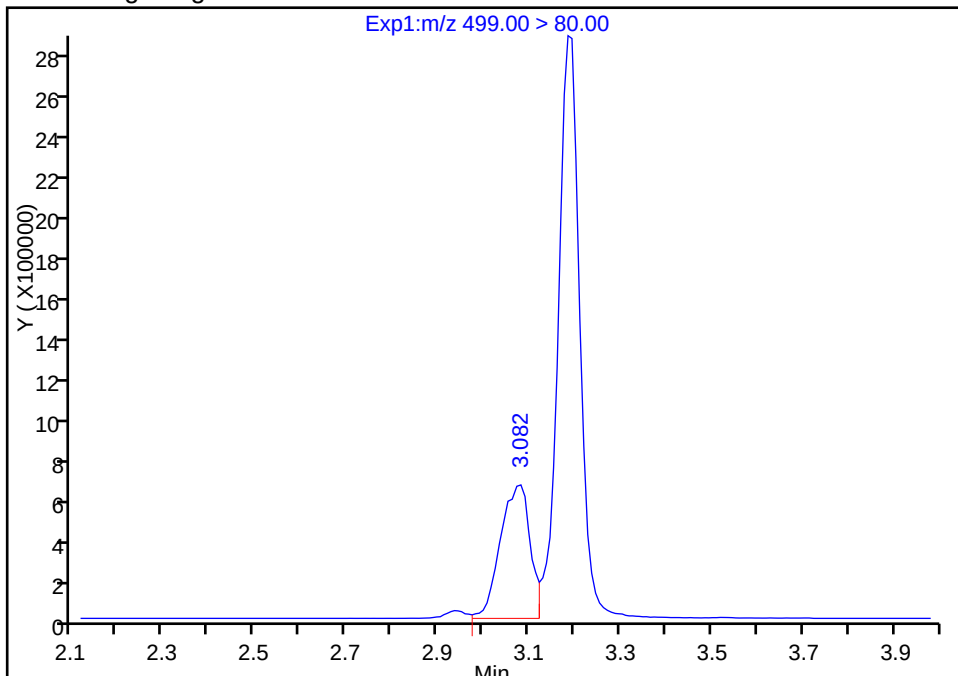
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
Injection Date: 12-Mar-2017 03:20:35 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

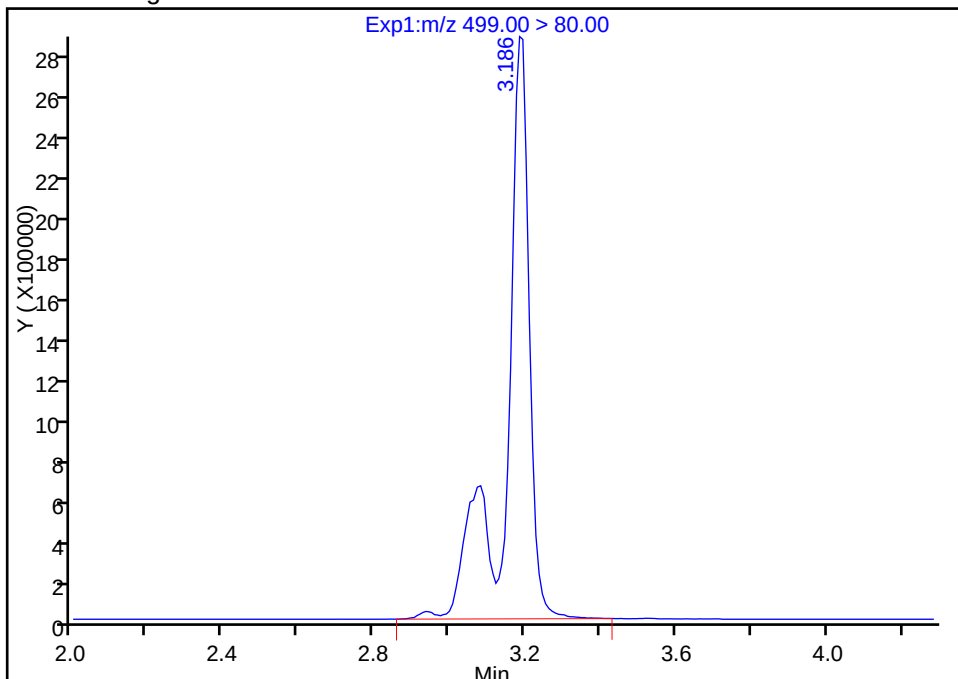
RT: 3.08  
Area: 2936819  
Amount: 13.162566  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 12361932  
Amount: 48.931678  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:53:09

Audit Action: Assigned Compound ID

Audit Reason: Isomers



## TestAmerica Sacramento

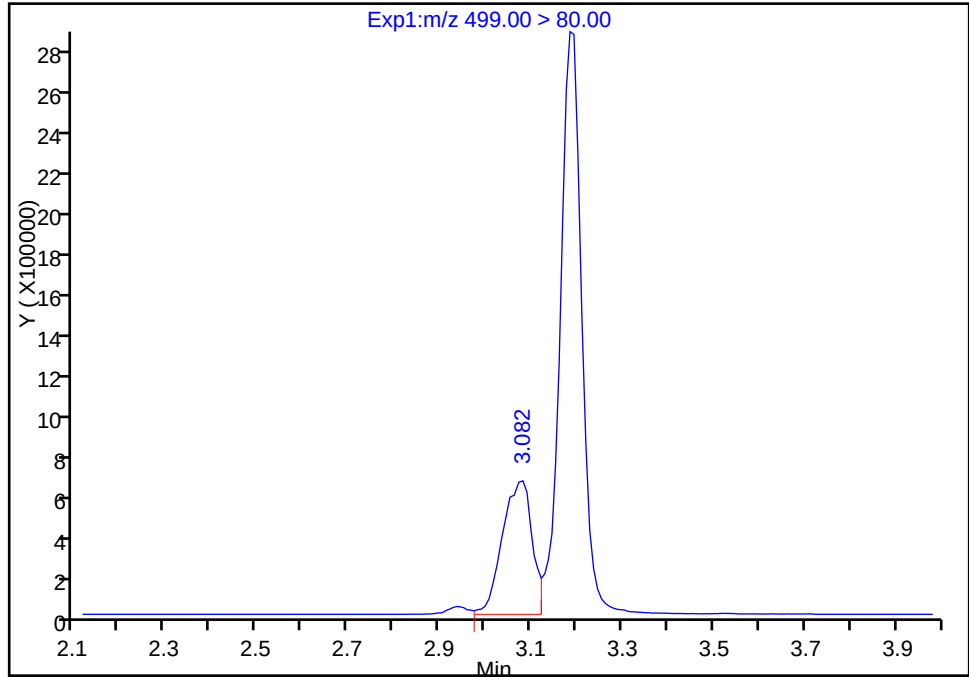
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
Injection Date: 12-Mar-2017 03:20:35 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

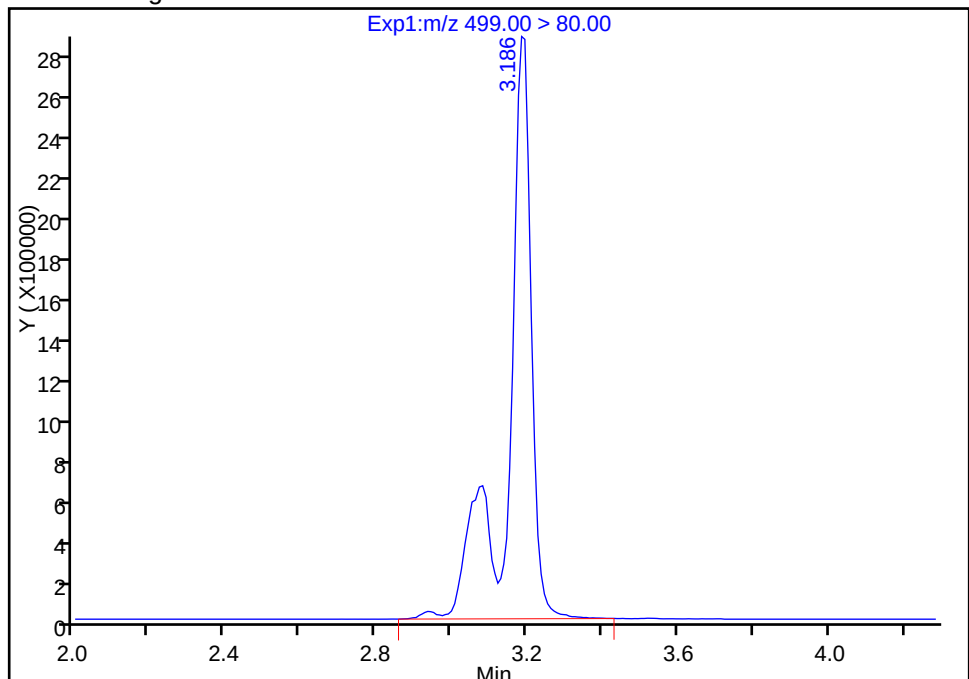
RT: 3.08  
Area: 2936819  
Amount: 13.162566  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 12361932  
Amount: 48.931678  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:55:44

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

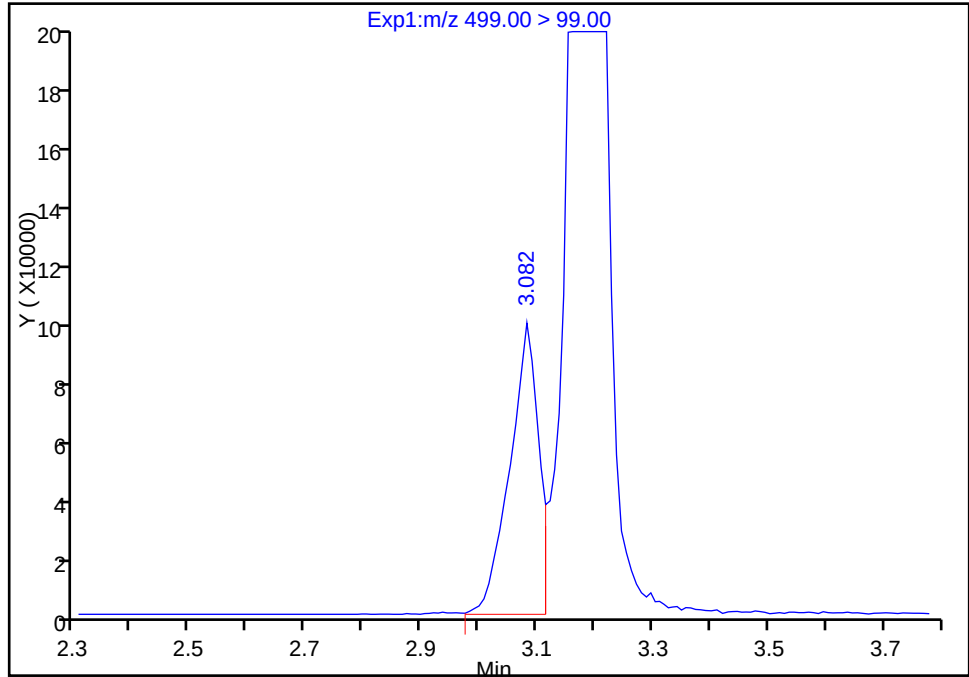
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
Injection Date: 12-Mar-2017 03:20:35 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

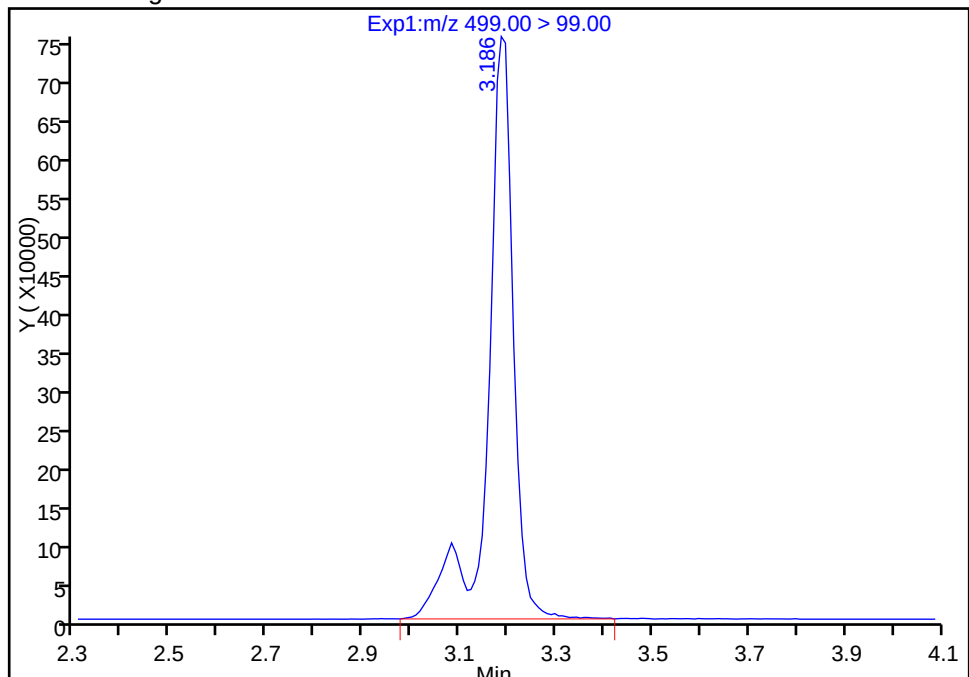
RT: 3.08  
Area: 335823  
Amount: 13.162566  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 2787304  
Amount: 48.931678  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:55:44

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

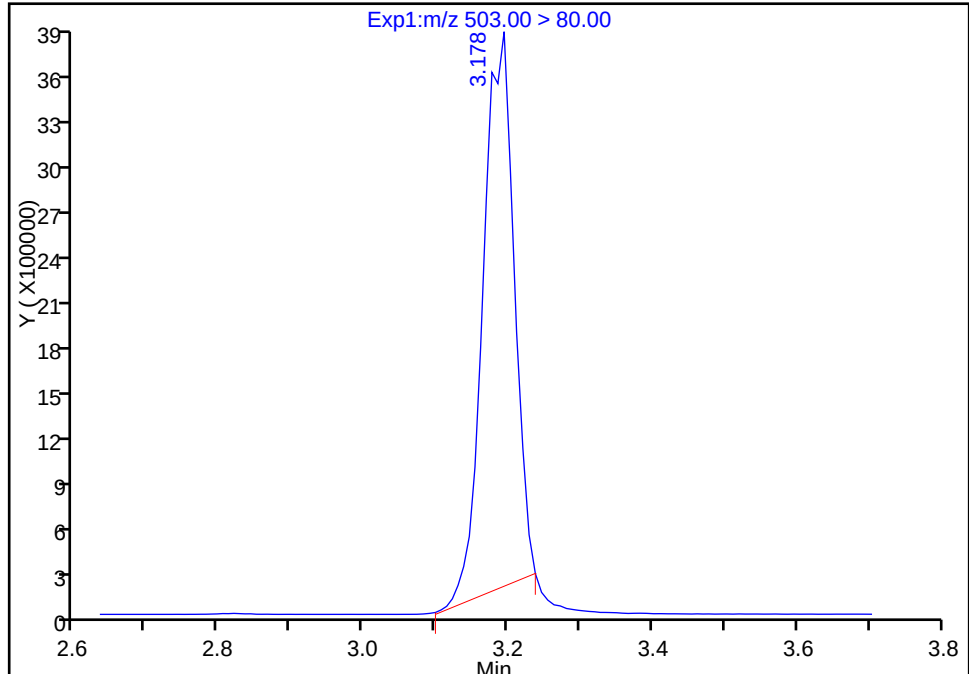
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_063.d  
Injection Date: 12-Mar-2017 03:20:35 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**D 18 13C4 PFOS, CAS: STL00991**

Signal: 1

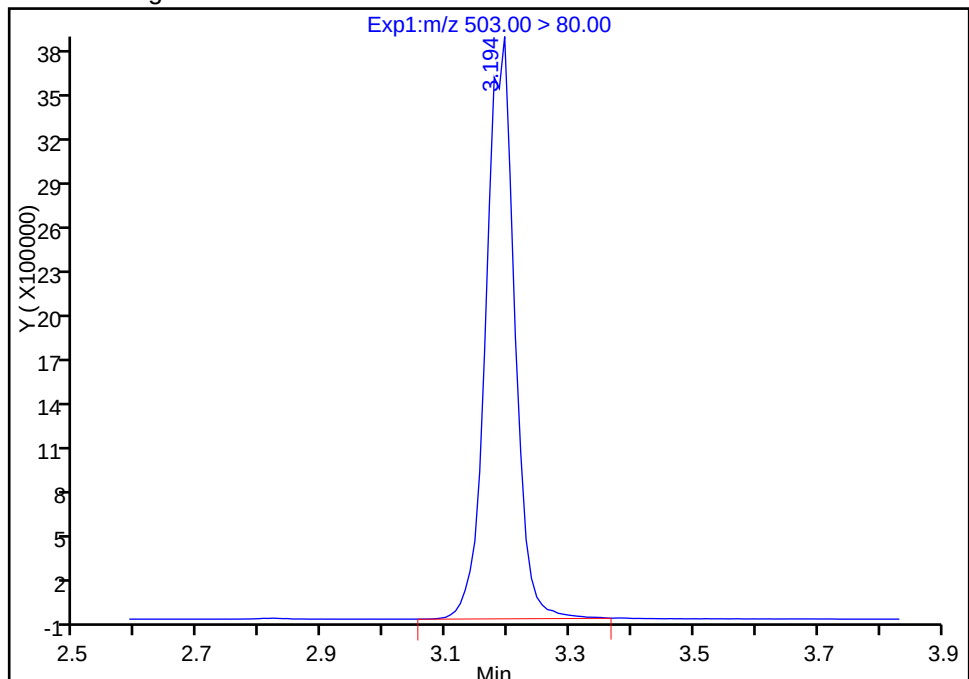
RT: 3.18  
Area: 10844211  
Amount: 44.878102  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 12278847  
Amount: 50.815255  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:53:46

Audit Action: Manually Integrated

Audit Reason: Baseline

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: CCV 320-154520/12 Calibration Date: 03/12/2017 04:43

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.11D\_074.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D    | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.8556 |         | 20.2        | 20.0         | 1.0   | 25.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 0.9382 |         | 19.2        | 20.0         | -4.1  | 25.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.443  |         | 17.8        | 17.7         | 0.7   | 25.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.8643 |         | 19.4        | 20.0         | -2.8  | 25.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 0.9227 |         | 19.1        | 20.0         | -4.6  | 25.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 0.9710 |         | 17.2        | 18.2         | -5.6  | 25.0   |
| 6:2FTS                                                     | L2ID       |         | 0.9569 |         | 20.3        | 19.0         | 7.3   | 25.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 0.9682 |         | 19.0        | 20.0         | -5.2  | 25.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.037  |         | 19.1        | 19.0         | 0.6   | 25.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 0.8888 |         | 19.7        | 20.0         | -1.7  | 25.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 0.9314 |         | 17.6        | 18.6         | -5.3  | 25.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.8960 |         | 19.9        | 20.0         | -0.3  | 25.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9855 |         | 20.4        | 19.2         | 6.2   | 25.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.9006 |         | 19.9        | 20.0         | -0.6  | 25.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 0.9220 |         | 19.0        | 20.0         | -5.1  | 25.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.5661 |         | 18.3        | 19.3         | -5.0  | 25.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.8714 |         | 19.1        | 20.0         | -4.3  | 25.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 0.8946 |         | 17.7        | 20.0         | -11.7 | 25.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9243 |         | 19.8        | 20.0         | -1.2  | 25.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.8677 |         | 19.0        | 20.0         | -5.1  | 25.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 0.9816 |         | 20.0        | 20.0         | -0.2  | 25.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.8417 |         | 19.3        | 20.0         | -3.6  | 25.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 1.654  |         | 16.8        | 20.0         | -15.9 | 25.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 0.7419 |         | 15.6        | 20.0         | -21.8 | 25.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.5801 |         | 16.2        | 20.0         | -19.2 | 25.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 322160 |         | 55.1        | 50.0         | 10.2  | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 254167 |         | 54.7        | 50.0         | 9.5   | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 228012 |         | 54.1        | 50.0         | 8.1   | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 213350 |         | 55.3        | 50.0         | 10.6  | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 319747 |         | 52.0        | 47.3         | 9.9   | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 83398  |         | 51.3        | 47.5         | 8.1   | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-154520/12 Calibration Date: 03/12/2017 04:43  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.11D\_074.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|-------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 218580 |        | 53.3           | 50.0            | 6.6   | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 267659 |        | 52.9           | 47.8            | 10.8  | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 191796 |        | 53.9           | 50.0            | 7.8   | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 382660 |        | 52.1           | 50.0            | 4.3   | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 97856  |        | 50.6           | 47.9            | 5.7   | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 168756 |        | 50.6           | 50.0            | 1.2   | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 88804  |        | 52.1           | 50.0            | 4.2   | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 88691  |        | 54.5           | 50.0            | 9.0   | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 133990 |        | 51.2           | 50.0            | 2.4   | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 84139  |        | 47.8           | 50.0            | -4.4  | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 121176 |        | 48.9           | 50.0            | -2.2  | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 78067  |        | 45.8           | 50.0            | -8.4  | 50.0      |
| 13C2-PFTeDA  | Ave           | 259165 | 237086 |        | 45.7           | 50.0            | -8.5  | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 103521 |        | 41.4           | 50.0            | -17.2 | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_074.d  
 Lims ID: CCV L4  
 Client ID:  
 Sample Type: CCV  
 Inject. Date: 12-Mar-2017 04:43:07 ALS Bottle#: 31 Worklist Smp#: 12  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L4  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub14  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:25:18 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:25:18

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.539 | 1.539  | 0.0    |        | 16108006 | 55.1         |                 | 110  | 833761 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                       | 1.539 | 1.539  | 0.0    | 1.000  | 5512525  | 20.2         |                 | 101  | 39471  |       |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.812 | 1.812  | 0.0    |        | 12708346 | 54.7         |                 | 109  | 747226 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.812 | 1.812  | 0.0    | 1.000  | 4769003  | 19.2         |                 | 95.9 | 44023  |       |
| D 47 13C3-PFBS                        |       |        |        |        |          |              |                 |      |        |       |
| 301.90 > 83.00                        | 1.852 | 1.852  | 0.0    |        | 310263   | NC           |                 |      |        |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.852 | 1.852  | 0.0    | 1.000  | 8155523  | 17.8         |                 | 101  |        |       |
| 298.90 > 99.00                        | 1.852 | 1.852  | 0.0    | 1.000  | 3259943  |              | 2.50(0.00-0.00) |      |        |       |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                       | 2.114 | 2.114  | 0.0    | 1.000  | 3941595  | 19.4         |                 | 97.2 | 79131  |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.114 | 2.114  | 0.0    |        | 11400600 | 54.1         |                 | 108  | 383310 |       |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                       | 2.452 | 2.452  | 0.0    | 1.000  | 3937022  | 19.1         |                 | 95.4 | 41754  |       |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.452 | 2.452  | 0.0    |        | 10667494 | 55.3         |                 | 111  | 393531 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 399.00 > 80.00                        | 2.468 | 2.468  | 0.0    | 1.000  | 5650815  | 17.2         |                 | 94.4 |        | M     |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.468 | 2.468  | 0.0    |        | 15124038 | 52.0         |                 | 110  | 328350 |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.787 | 2.787  | 0.0    | 1.000  | 1513067  | 20.3         |                 | 107  |        |       |

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 429.00 > 409.00                       | 2.787 | 2.787  | 0.0    |        | 3961417  | 51.3         |                 | 108  |        |       |
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.818 | 2.818  | 0.0    | 1.000  | 4232473  | 19.0         |                 | 94.8 | 41626  |       |
| 413.00 > 169.00                       | 2.818 | 2.818  | 0.0    | 1.000  | 2494221  |              | 1.70(0.90-1.10) |      | 71942  |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.818 | 2.818  | 0.0    |        | 10928990 | 53.3         |                 | 107  | 278326 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.826 | 2.826  | 0.0    | 1.000  | 5283476  | 19.1         |                 | 101  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.193 | 3.186  | 0.007  | 1.000  | 4627083  | 17.6         |                 | 94.7 | 134574 | M     |
| 499.00 > 99.00                        | 3.193 | 3.186  | 0.007  | 1.000  | 1032353  |              | 4.48(0.90-1.10) |      | 70636  | M     |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.193 | 3.193  | 0.0    | 1.000  | 3409504  | 19.7         |                 | 98.3 | 61000  |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.193 | 3.193  | 0.0    |        | 12794085 | 52.9         |                 | 111  | 281971 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.193 | 3.193  | 0.0    |        | 9589807  | 53.9         |                 | 108  | 344349 |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.534 | 3.534  | 0.0    |        | 19132982 | 52.1         |                 | 104  | 501230 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.534 | 3.534  | 0.0    | 1.000  | 6857546  | 19.9         |                 | 99.7 | 163952 |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.543 | 3.543  | 0.0    | 1.000  | 1847645  | 20.4         |                 | 106  |        |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.543 | 3.543  | 0.0    |        | 4687300  | 50.6         |                 | 106  |        |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.559 | 3.559  | 0.0    | 1.000  | 3039636  | 19.9         |                 | 99.4 | 95533  |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.551 | 3.551  | 0.0    |        | 8437778  | 50.6         |                 | 101  | 238789 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.700 | 3.700  | 0.0    |        | 4440186  | 52.1         |                 | 104  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.711 | 3.711  | 0.0    | 1.003  | 1637495  | 19.0         |                 | 94.9 |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.854 | 3.854  | 0.0    | 1.000  | 2921132  | 18.3         |                 | 95.0 |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.880 | 3.880  | 0.0    |        | 6699517  | 51.2         |                 | 102  | 247198 |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.872 | 3.872  | 0.0    |        | 4434529  | 54.5         |                 | 109  |        |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.880 | 3.880  | 0.0    | 1.000  | 2397221  | 17.7         |                 | 88.3 | 67312  |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.880 | 3.880  | 0.0    | 1.002  | 1545675  | 19.1         |                 | 95.7 |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 4.033 | 4.033  | 0.0    | 1.000  | 1555441  | 19.8         |                 | 98.8 |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.024 | 4.024  | 0.0    |        | 4206937  | 47.8         |                 | 95.6 |        |       |

| Signal                                | RT              | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-----------------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| 37 Perfluorododecanoic acid           | 613.00 > 569.00 | 4.163     | 4.163     | 0.0       | 1.000    | 2102780         | 19.0            | 94.9 | 19713  |       |
| D 36 13C2 PFDaA                       | 615.00 > 570.00 | 4.170     | 4.170     | 0.0       |          | 6058803         | 48.9            | 97.8 | 122454 |       |
| D 38 d-N-EtFOSA-M                     | 531.00 > 169.00 | 4.213     | 4.213     | 0.0       |          | 3903371         | 45.8            | 91.6 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami | 526.00 > 169.00 | 4.222     | 4.222     | 0.0       | 1.000    | 1532629         | 20.0            | 99.8 |        |       |
| 41 Perfluorotridecanoic acid          | 663.00 > 619.00 | 4.430     | 4.430     | 0.0       | 1.000    | 2039872         | 19.3            | 96.4 | 34130  |       |
| 42 Perfluorotetradecanoic acid        | 712.50 > 668.90 | 4.664     | 4.664     | 0.0       | 1.000    | 4007666         | 16.8            | 84.1 | 27300  |       |
|                                       | 713.00 > 169.00 | 4.664     | 4.664     | 0.0       | 1.000    | 572616          | 7.00(0.00-0.00) |      | 66182  |       |
| D 43 13C2-PFTeDA                      | 715.00 > 670.00 | 4.664     | 4.664     | 0.0       |          | 11854289        | 45.7            | 91.5 | 354590 |       |
| D 44 13C2-PFHxDA                      | 815.00 > 770.00 | 5.077     | 5.077     | 0.0       |          | 5176048         | 41.4            | 82.8 | 83013  |       |
| 45 Perfluorohexadecanoic acid         | 813.00 > 769.00 | 5.077     | 5.077     | 0.0       | 1.000    | 1798111         | 15.6            | 78.2 | 1418   |       |
| 46 Perfluorooctadecanoic acid         | 913.00 > 869.00 | 5.428     | 5.428     | 0.0       | 1.000    | 1405779         | 16.2            | 80.8 | 1635   |       |

**QC Flag Legend**

Processing Flags

NC - Not Calibrated

Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L4\_00001

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_074.d

Injection Date: 12-Mar-2017 04:43:07

Instrument ID: A8\_N

Lims ID: CCV L4

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 31

Worklist Smp#: 12

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

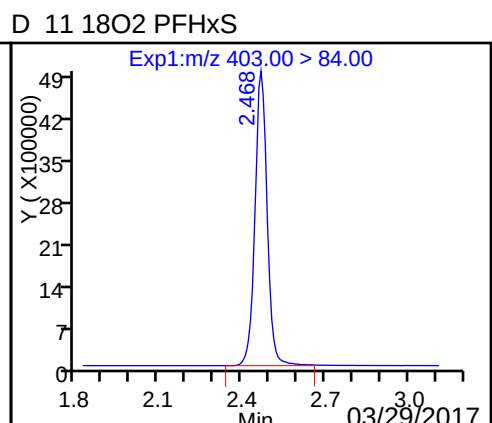
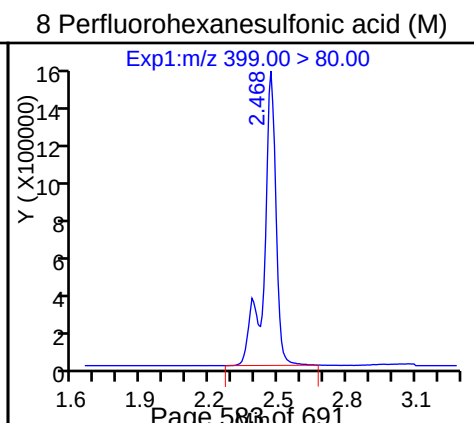
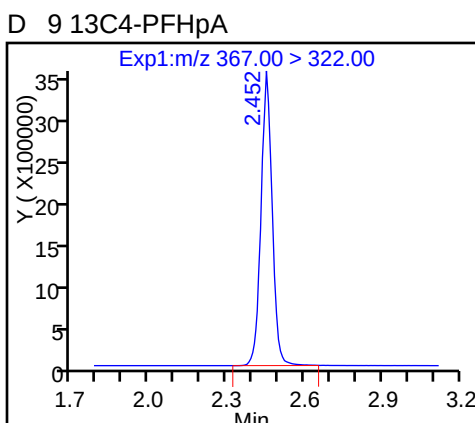
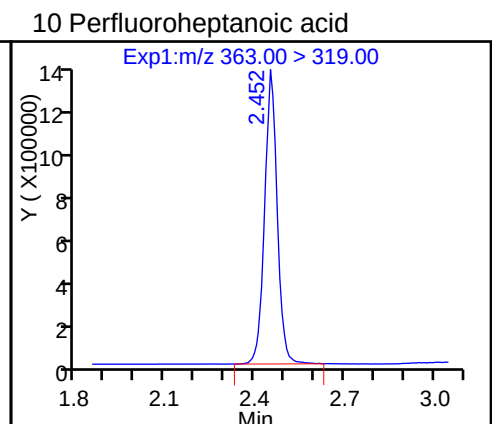
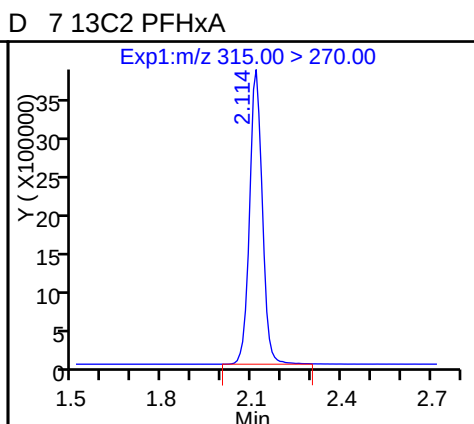
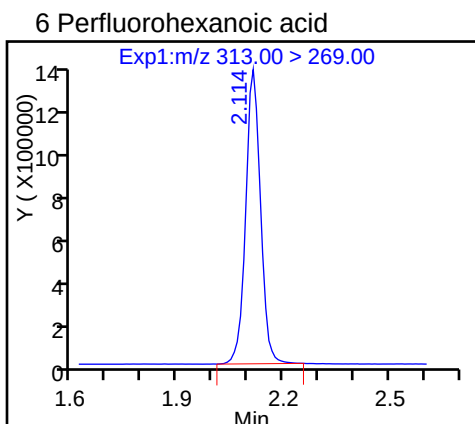
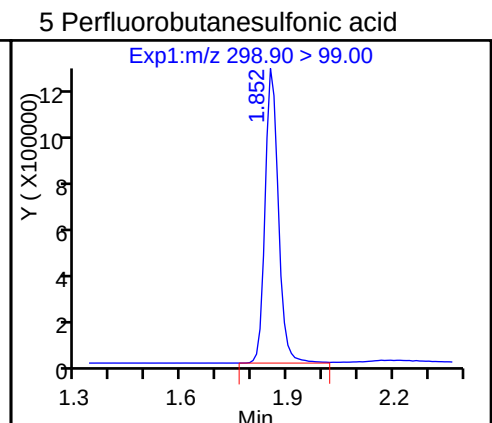
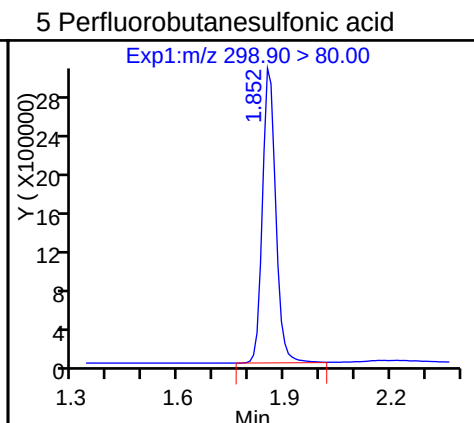
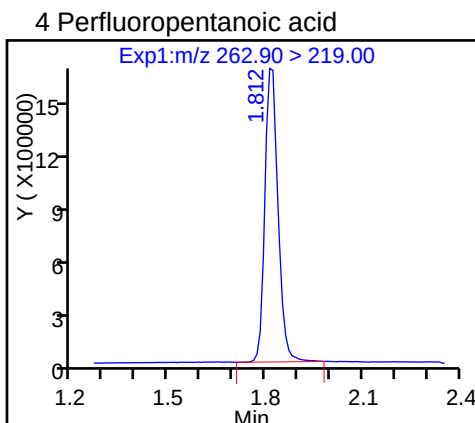
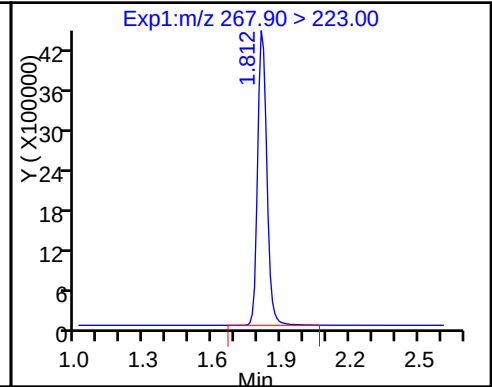
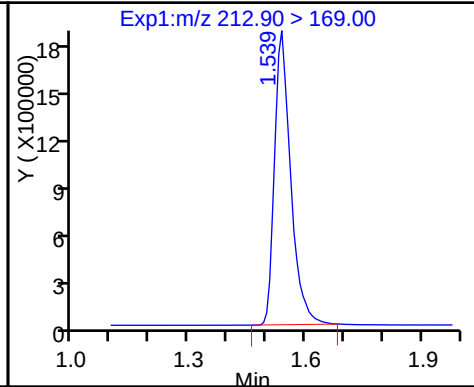
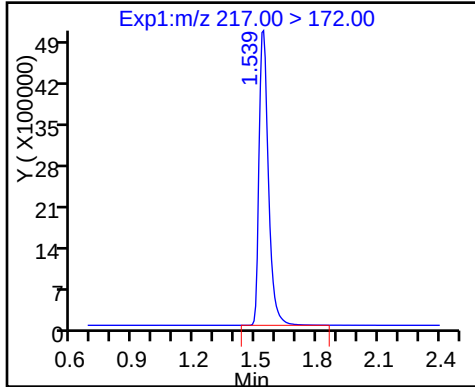
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

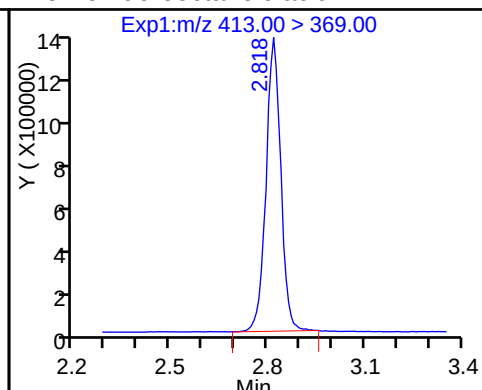
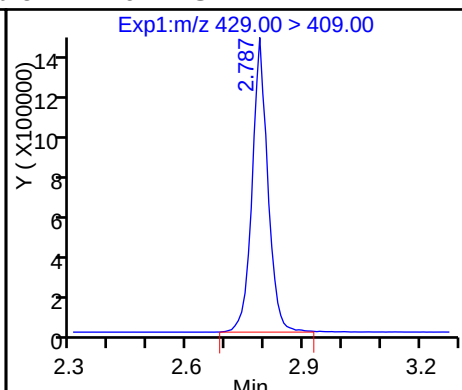
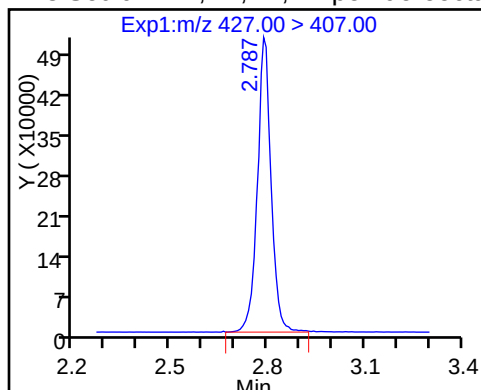
2 Perfluorobutyric acid

D 3 13C5-PFPeA



## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS

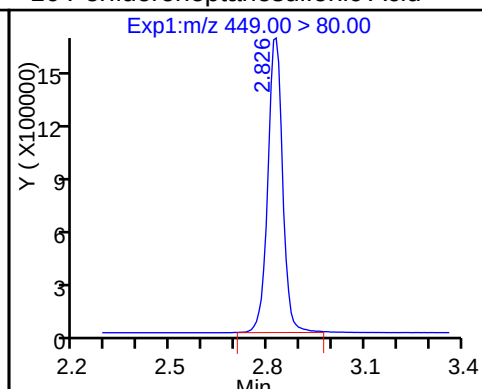
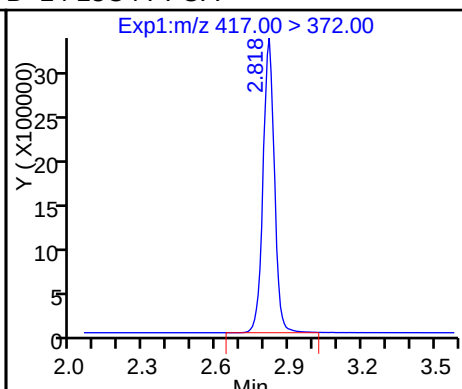
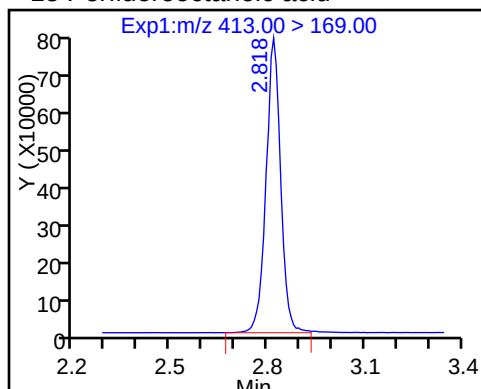
## 15 Perfluorooctanoic acid



## 15 Perfluorooctanoic acid

## D 14 13C4 PFOA

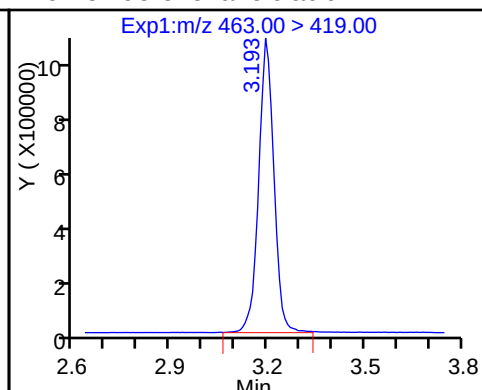
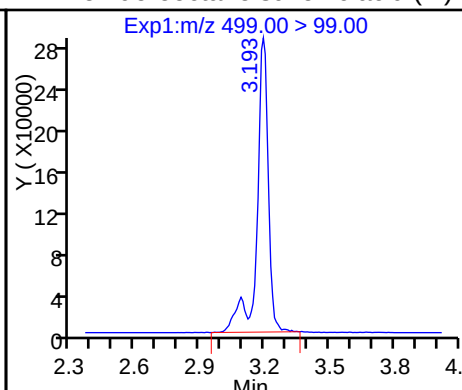
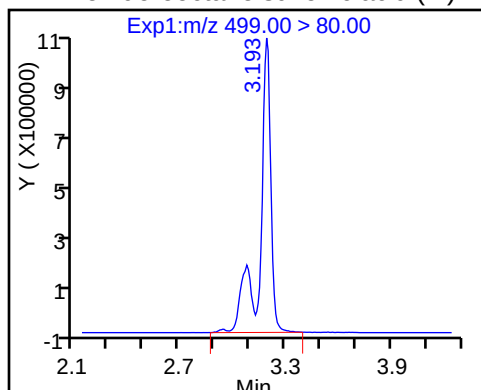
## 16 Perfluoroheptanesulfonic Acid



## 17 Perfluorooctane sulfonic acid (M)

## 17 Perfluorooctane sulfonic acid (M)

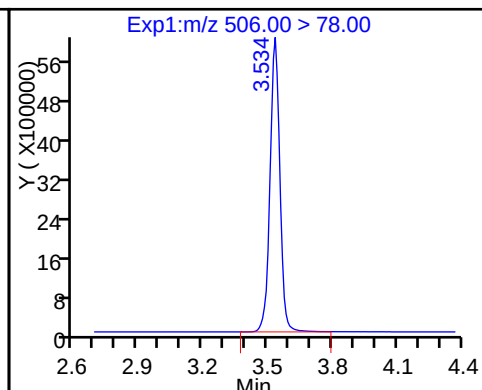
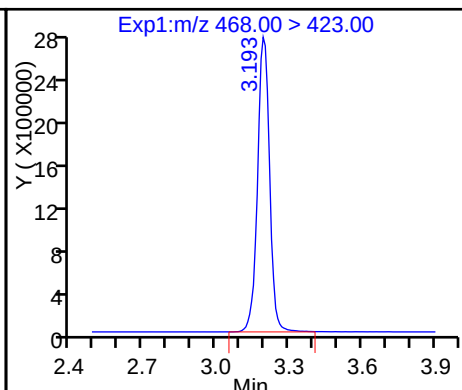
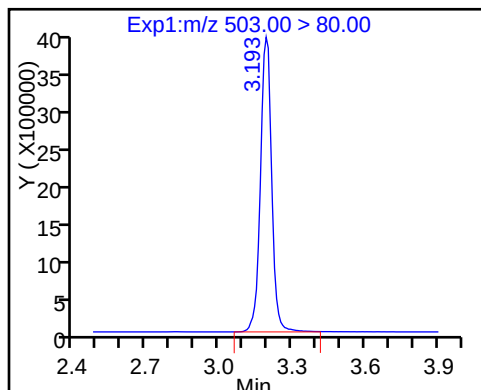
## 20 Perfluorononanoic acid



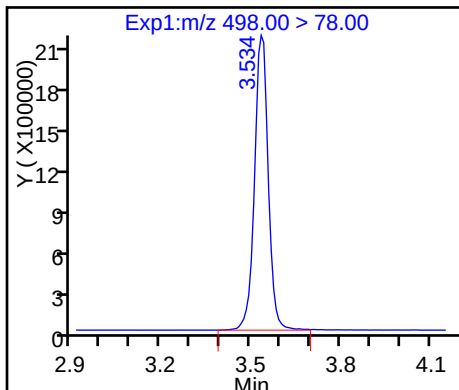
## D 18 13C4 PFOS

## D 19 13C5 PFNA

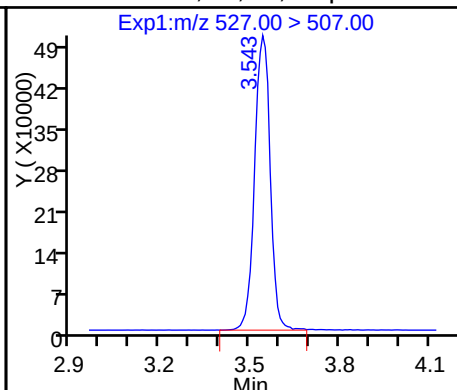
## D 21 13C8 FOSA



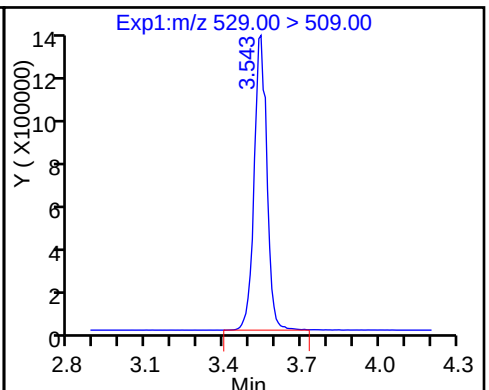
22 Perfluorooctane Sulfonamide



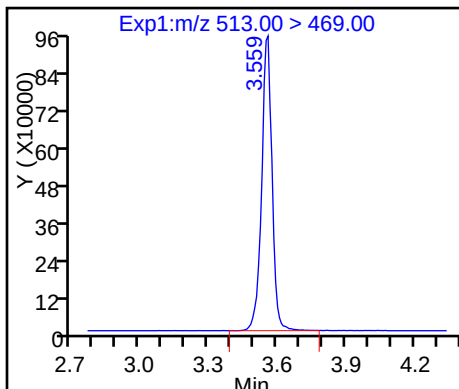
25 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



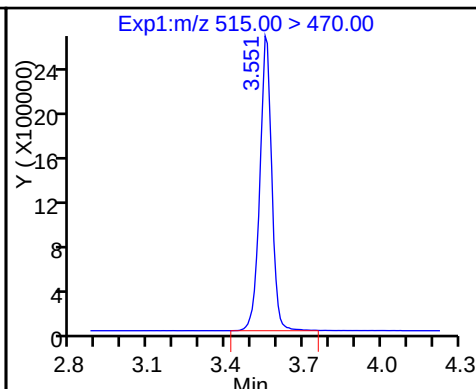
26 M2-8:2FTS



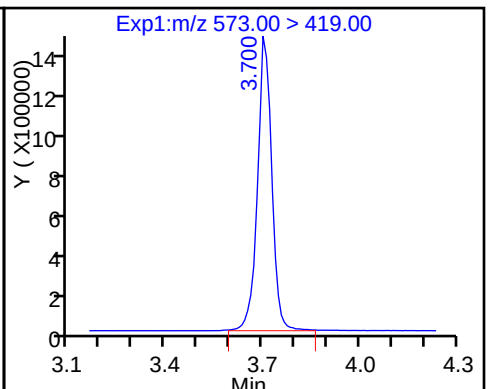
24 Perfluorodecanoic acid



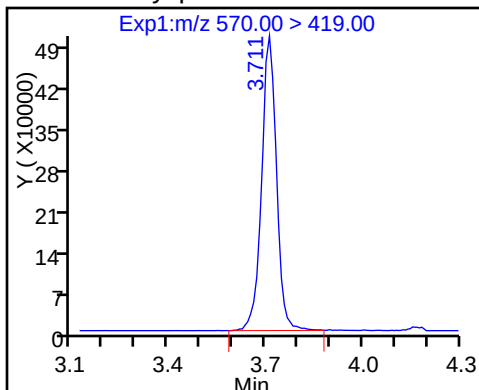
D 23 13C2 PFDA



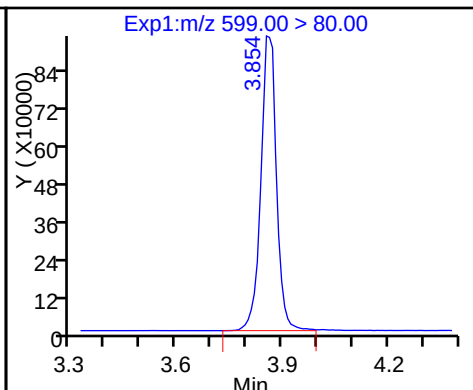
D 27 d3-NMeFOSAA



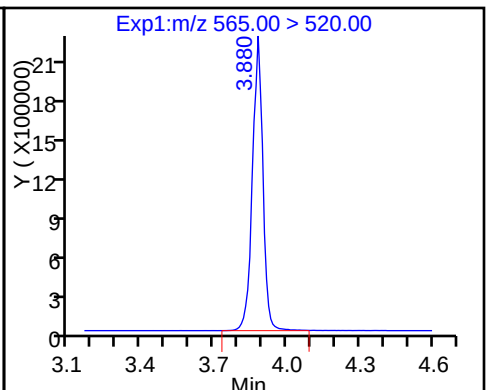
28 N-methyl perfluorooctane sulfonamide



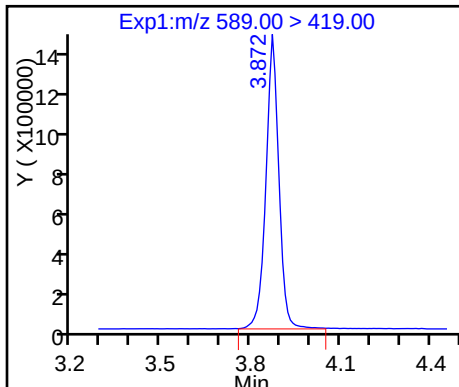
29 Perfluorodecane Sulfonic acid



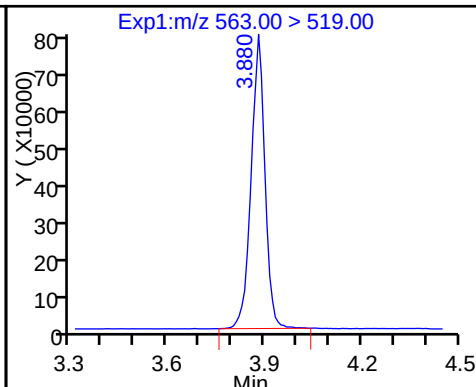
D 30 13C2 PFUnA



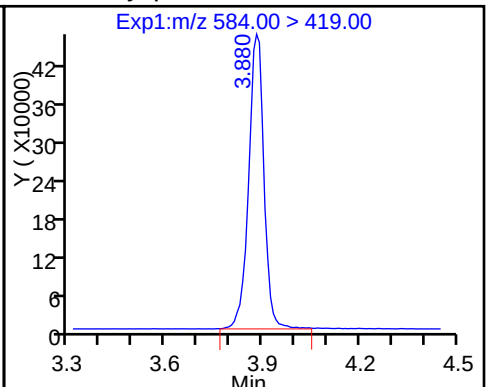
D 32 d5-NEtFOSAA



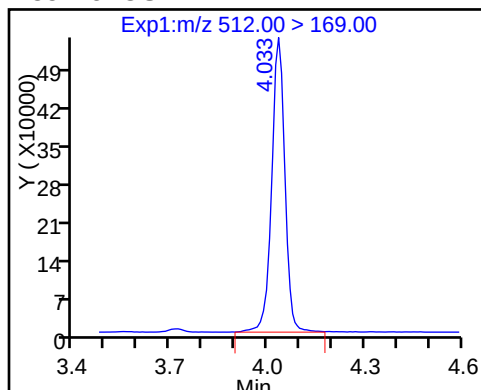
31 Perfluoroundecanoic acid



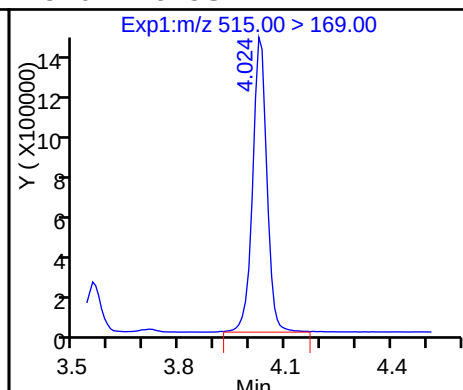
33 N-ethyl perfluorooctane sulfonamide



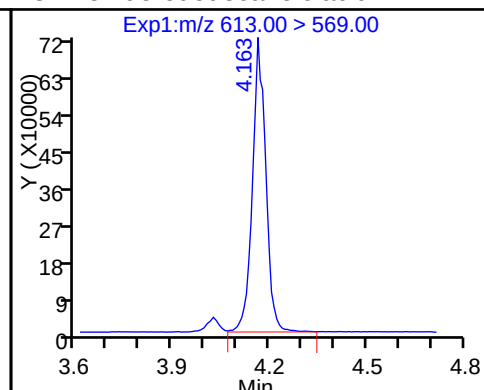
35 MeFOSA



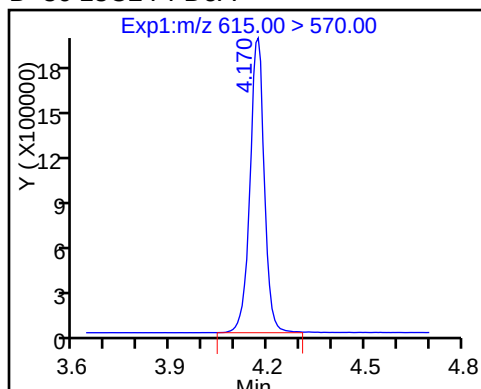
D 34 d-N-MeFOSA-M



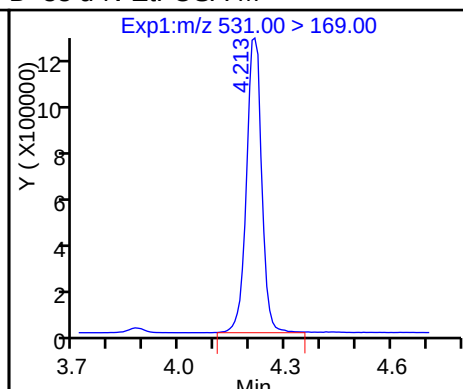
37 Perfluorododecanoic acid



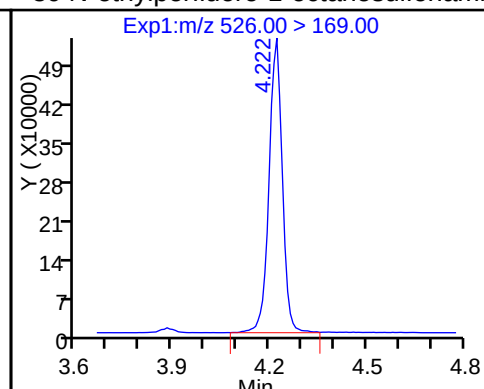
D 36 13C2 PFDaA



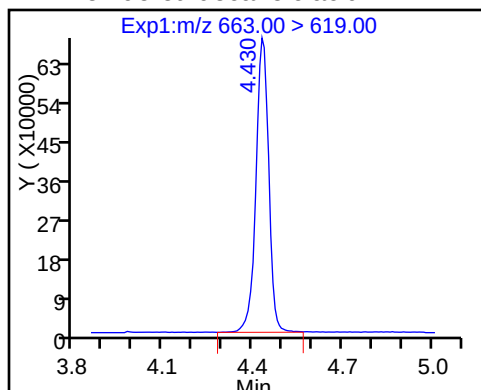
D 38 d-N-EtFOSA-M



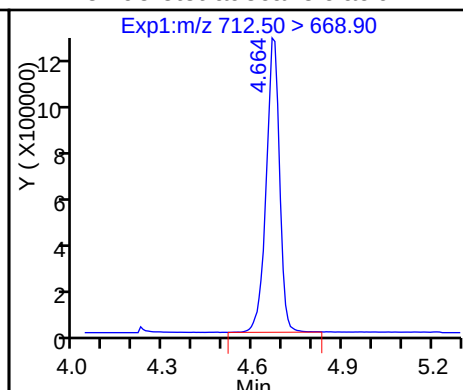
39 N-ethylperfluoro-1-octanesulfonami



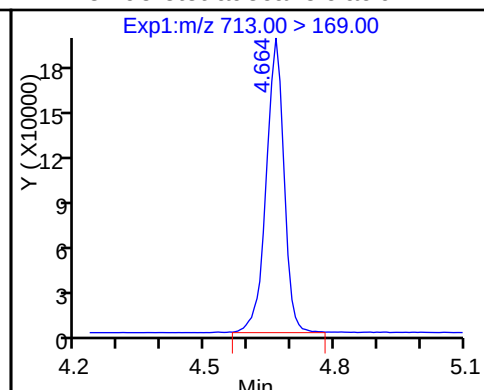
41 Perfluorotridecanoic acid



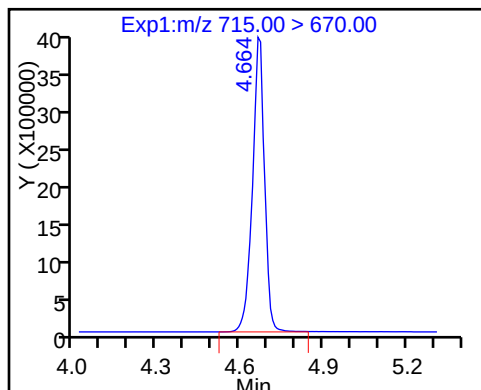
42 Perfluorotetradecanoic acid



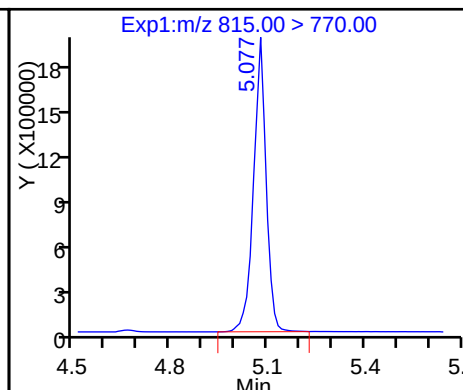
42 Perfluorotetradecanoic acid



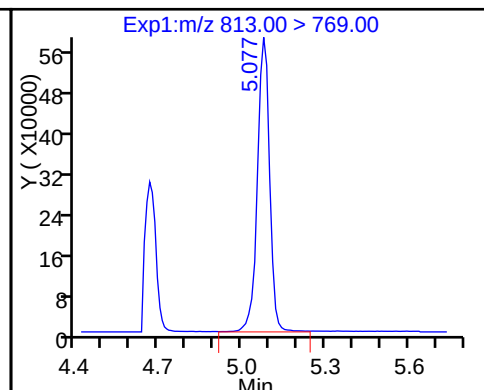
D 43 13C2-PFTeDA



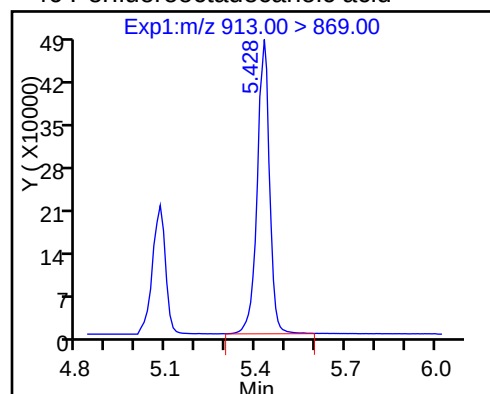
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

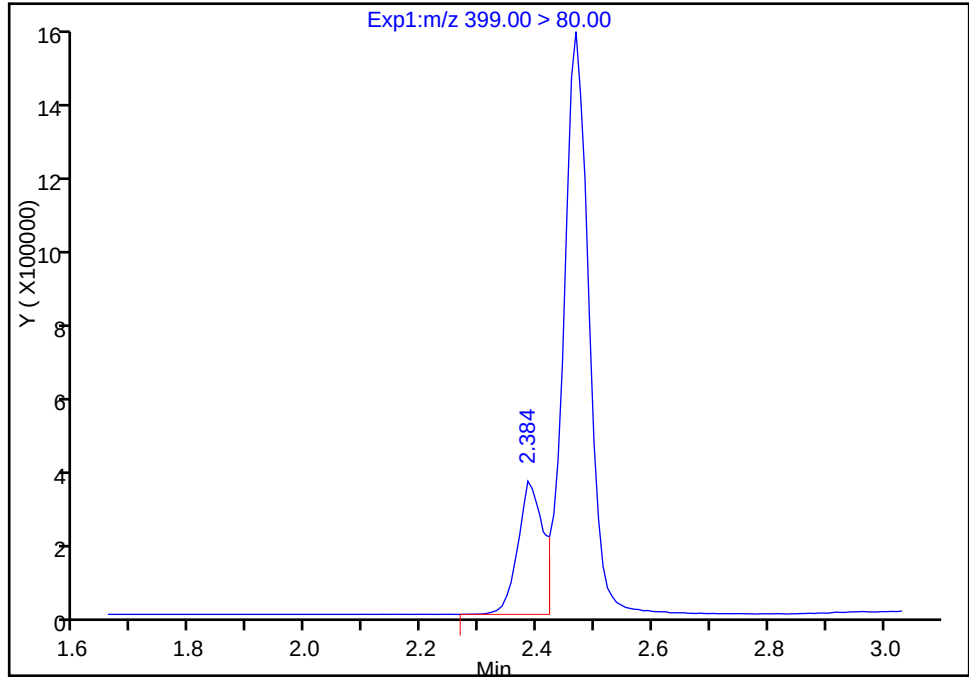
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_074.d  
Injection Date: 12-Mar-2017 04:43:07 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

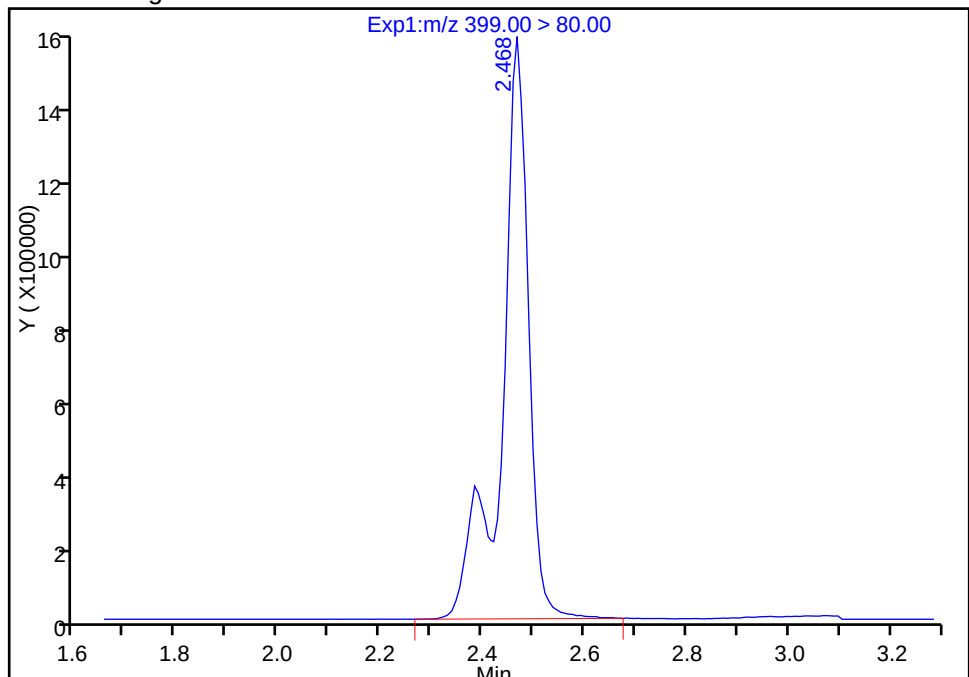
RT: 2.38  
Area: 1057480  
Amount: 3.215771  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.47  
Area: 5650815  
Amount: 17.183992  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:22:43

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

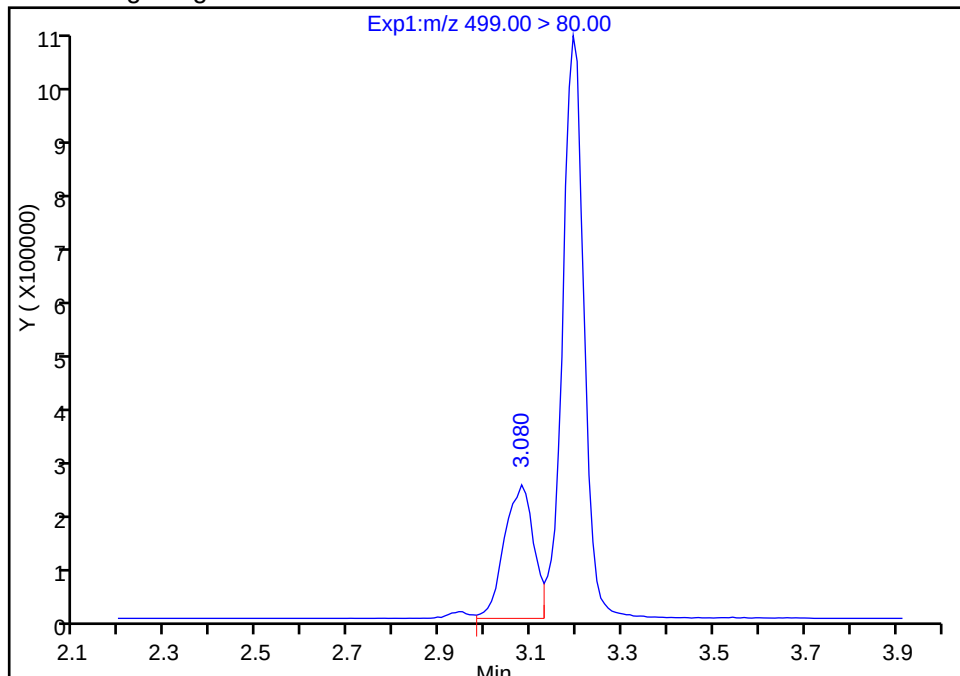
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_074.d  
Injection Date: 12-Mar-2017 04:43:07 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

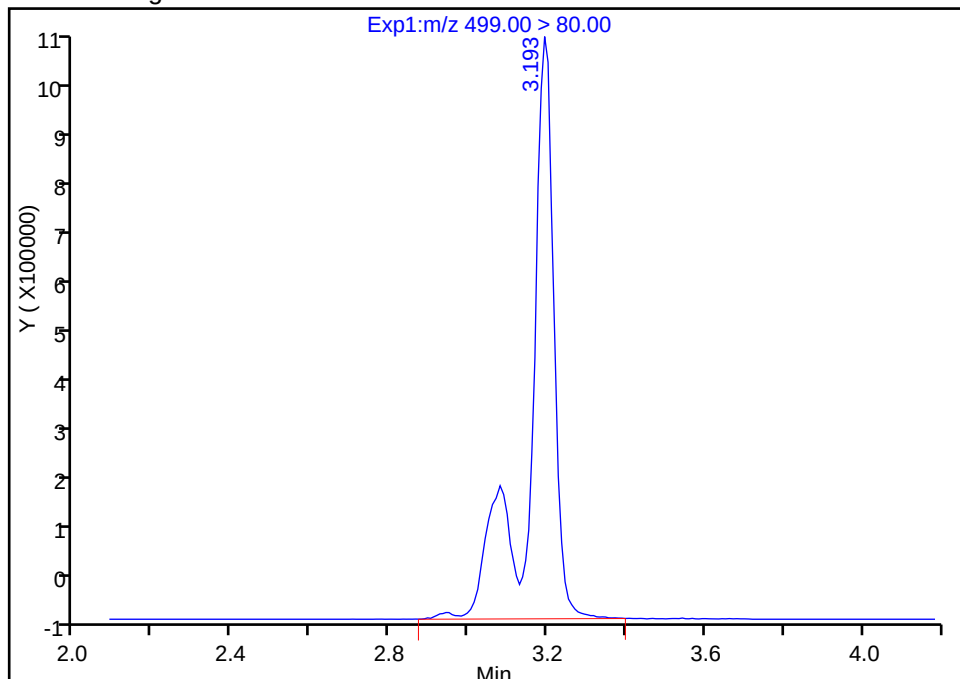
RT: 3.08  
Area: 1094439  
Amount: 4.157609  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 4627083  
Amount: 17.577593  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:22:56

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

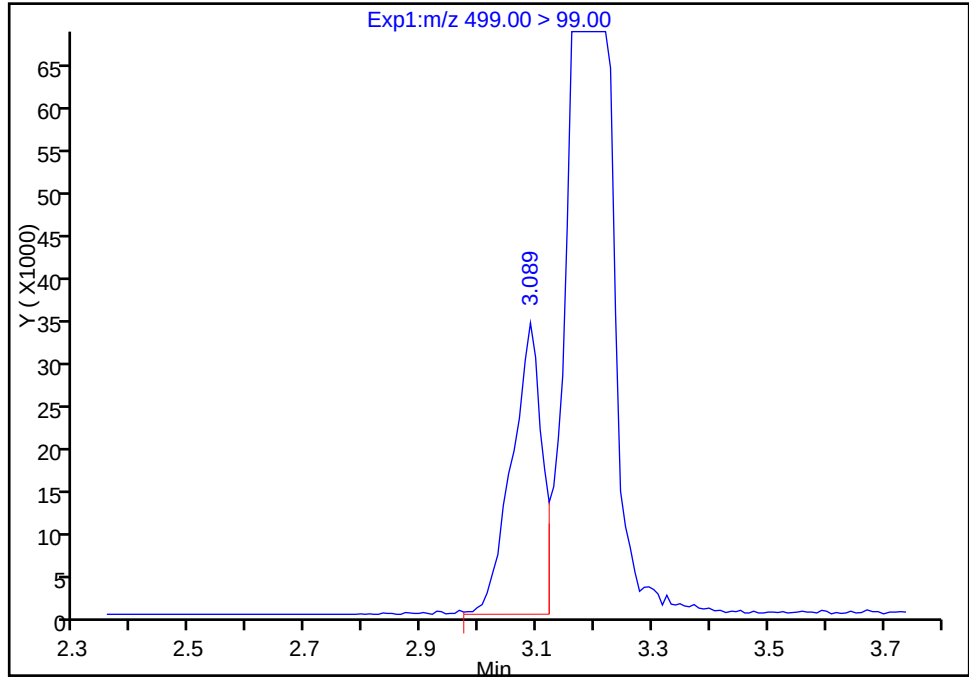
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_074.d  
Injection Date: 12-Mar-2017 04:43:07 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 31 Worklist Smp#: 12  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

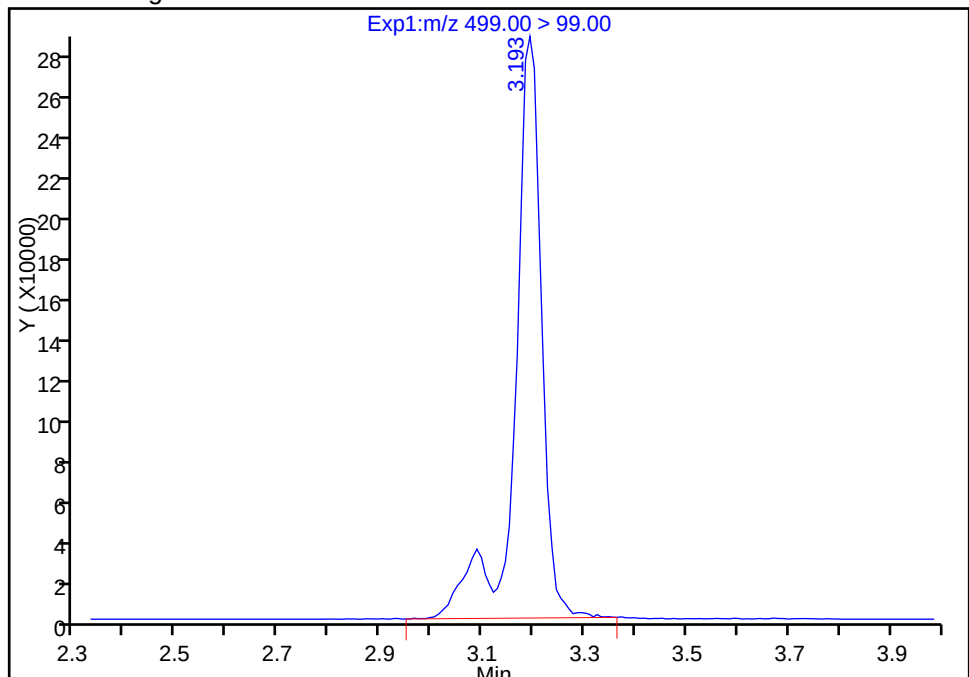
RT: 3.09  
Area: 121010  
Amount: 4.157609  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 1032353  
Amount: 17.577593  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:23:32

Audit Action: Manually Integrated

Audit Reason: Isomers



FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: CCV 320-155237/1 Calibration Date: 03/15/2017 20:08

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.15D\_024.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D   | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.8999 |         | 53.1        | 50.0         | 6.2  | 25.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 0.995  |         | 50.9        | 50.0         | 1.7  | 25.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.378  |         | 42.5        | 44.2         | -3.8 | 25.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.9421 |         | 53.0        | 50.0         | 5.9  | 25.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 1.017  |         | 45.0        | 45.5         | -1.1 | 25.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 0.9581 |         | 49.5        | 50.0         | -0.9 | 25.0   |
| 6:2FTS                                                     | L2ID       |         | 0.8986 |         | 47.9        | 47.4         | 1.1  | 25.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 1.009  |         | 49.4        | 50.0         | -1.2 | 25.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.105  |         | 51.0        | 47.6         | 7.2  | 25.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 0.9945 |         | 46.9        | 46.4         | 1.1  | 25.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 0.9604 |         | 53.1        | 50.0         | 6.2  | 25.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9289 |         | 48.1        | 47.9         | 0.4  | 25.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.9471 |         | 52.7        | 50.0         | 5.4  | 25.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.9402 |         | 51.9        | 50.0         | 3.8  | 25.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 0.9382 |         | 48.3        | 50.0         | -3.4 | 25.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.6053 |         | 49.0        | 48.2         | 1.6  | 25.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.8806 |         | 48.4        | 50.0         | -3.3 | 25.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 0.9579 |         | 47.2        | 50.0         | -5.5 | 25.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9106 |         | 48.7        | 50.0         | -2.7 | 25.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.9020 |         | 49.3        | 50.0         | -1.4 | 25.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 0.9565 |         | 48.6        | 50.0         | -2.8 | 25.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.8915 |         | 51.0        | 50.0         | 2.1  | 25.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 1.792  |         | 45.6        | 50.0         | -8.9 | 25.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 0.8652 |         | 46.3        | 50.0         | -7.4 | 25.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.7007 |         | 48.8        | 50.0         | -2.3 | 25.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 315769 |         | 54.0        | 50.0         | 8.1  | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 239081 |         | 51.5        | 50.0         | 3.0  | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 239851 |         | 56.9        | 50.0         | 13.7 | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 217232 |         | 56.3        | 50.0         | 12.6 | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 326942 |         | 53.2        | 47.3         | 12.4 | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 103864 |         | 63.9        | 47.5         | 34.6 | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-155237/1 Calibration Date: 03/15/2017 20:08  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.15D\_024.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|-------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 214226 |        | 52.3           | 50.0            | 4.5   | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 257000 |        | 50.8           | 47.8            | 6.4   | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 182513 |        | 51.3           | 50.0            | 2.6   | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 362701 |        | 49.4           | 50.0            | -1.1  | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 103423 |        | 53.5           | 47.9            | 11.7  | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 156047 |        | 46.8           | 50.0            | -6.4  | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 78529  |        | 46.1           | 50.0            | -7.8  | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 73166  |        | 45.0           | 50.0            | -10.1 | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 118068 |        | 45.1           | 50.0            | -9.7  | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 86342  |        | 49.1           | 50.0            | -1.9  | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 114468 |        | 46.2           | 50.0            | -7.6  | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 77349  |        | 45.4           | 50.0            | -9.3  | 50.0      |
| 13C2-PFTeDA  | Ave           | 259165 | 233422 |        | 45.0           | 50.0            | -9.9  | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 120129 |        | 48.0           | 50.0            | -3.9  | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_024.d  
 Lims ID: CCV L5  
 Client ID:  
 Sample Type: CCV  
 Inject. Date: 15-Mar-2017 20:08:47 ALS Bottle#: 32 Worklist Smp#: 1  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L5  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub14  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 16-Mar-2017 11:48:41 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 16-Mar-2017 10:51:42

| Signal                         | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N     | Flags |
|--------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|---------|-------|
| D 1 13C4 PFBA                  |       |        |        |        |          |              |                 |      |         |       |
| 217.00 > 172.00                | 1.523 | 1.523  | 0.0    |        | 15788432 | 54.0         |                 | 108  | 1067183 |       |
| 2 Perfluorobutyric acid        |       |        |        |        |          |              |                 |      |         |       |
| 212.90 > 169.00                | 1.523 | 1.523  | 0.0    | 1.000  | 14207908 | 53.1         |                 | 106  | 128188  |       |
| 4 Perfluoropentanoic acid      |       |        |        |        |          |              |                 |      |         |       |
| 262.90 > 219.00                | 1.802 | 1.802  | 0.0    | 1.000  | 11897562 | 50.9         |                 | 102  | 125659  |       |
| D 3 13C5-PFPeA                 |       |        |        |        |          |              |                 |      |         |       |
| 267.90 > 223.00                | 1.802 | 1.802  | 0.0    |        | 11954060 | 51.5         |                 | 103  | 958933  |       |
| D 47 13C3-PFBS                 |       |        |        |        |          |              |                 |      |         |       |
| 301.90 > 83.00                 | 1.831 | 1.831  | 0.0    |        | 312428   | NC           |                 |      |         |       |
| 5 Perfluorobutanesulfonic acid |       |        |        |        |          |              |                 |      |         |       |
| 298.90 > 80.00                 | 1.841 | 1.841  | 0.0    | 1.000  | 19908979 | 42.5         |                 | 96.2 |         |       |
| 298.90 > 99.00                 | 1.831 | 1.841  | -0.010 | 0.995  | 8780454  |              | 2.27(0.00-0.00) |      |         |       |
| D 7 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |         |       |
| 315.00 > 270.00                | 2.094 | 2.094  | 0.0    |        | 11992568 | 56.9         |                 | 114  | 465564  |       |
| 6 Perfluorohexanoic acid       |       |        |        |        |          |              |                 |      |         |       |
| 313.00 > 269.00                | 2.094 | 2.094  | 0.0    | 1.000  | 11297716 | 53.0         |                 | 106  | 368702  |       |
| 8 Perfluorohexanesulfonic acid |       |        |        |        |          |              |                 |      |         |       |
| 399.00 > 80.00                 | 2.365 | 2.365  | 0.0    | 1.000  | 15127718 | 45.0         |                 | 98.9 |         |       |
| D 9 13C4-PFHpA                 |       |        |        |        |          |              |                 |      |         |       |
| 367.00 > 322.00                | 2.426 | 2.426  | 0.0    |        | 10861583 | 56.3         |                 | 113  | 436185  |       |
| 10 Perfluoroheptanoic acid     |       |        |        |        |          |              |                 |      |         |       |
| 363.00 > 319.00                | 2.426 | 2.426  | 0.0    | 1.000  | 10406922 | 49.5         |                 | 99.1 | 111080  |       |
| D 11 18O2 PFHxS                |       |        |        |        |          |              |                 |      |         |       |
| 403.00 > 84.00                 | 2.441 | 2.441  | 0.0    |        | 15464365 | 53.2         |                 | 112  | 617035  |       |
| D 12 M2-6:2FTS                 |       |        |        |        |          |              |                 |      |         |       |
| 429.00 > 409.00                | 2.754 | 2.754  | 0.0    |        | 4933521  | 63.9         |                 | 135  |         |       |

| Signal                                | RT              | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-----------------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 13 Sodium 1H,1H,2H,2H-perfluorooctane | 427.00 > 407.00 | 2.762  | 2.762  | 0.0    | 1.000    | 4423974      | 47.9            | 101  |        |       |
| 15 Perfluorooctanoic acid             | 413.00 > 369.00 | 2.784  | 2.784  | 0.0    | 1.000    | 10810335     | 49.4            | 98.8 | 96956  |       |
|                                       | 413.00 > 169.00 | 2.784  | 2.784  | 0.0    | 1.000    | 6420476      | 1.68(0.90-1.10) |      | 189090 |       |
| D 14 13C4 PFOA                        | 417.00 > 372.00 | 2.784  | 2.784  | 0.0    |          | 10711313     | 52.3            | 105  | 280329 |       |
| 16 Perfluoroheptanesulfonic Acid      | 449.00 > 80.00  | 2.792  | 2.792  | 0.0    | 1.000    | 13513825     | 51.0            | 107  |        |       |
| 17 Perfluorooctane sulfonic acid      | 499.00 > 80.00  | 3.156  | 3.156  | 0.0    | 1.000    | 11858831     | 46.9            | 101  | 281486 | M     |
|                                       | 499.00 > 99.00  | 3.156  | 3.156  | 0.0    | 1.000    | 2714452      | 4.37(0.90-1.10) |      | 821800 | M     |
| D 18 13C4 PFOS                        | 503.00 > 80.00  | 3.156  | 3.156  | 0.0    |          | 12284610     | 50.8            | 106  | 217947 |       |
| D 19 13C5 PFNA                        | 468.00 > 423.00 | 3.156  | 3.156  | 0.0    |          | 9125664      | 51.3            | 103  | 261178 |       |
| 20 Perfluorononanoic acid             | 463.00 > 419.00 | 3.164  | 3.164  | 0.0    | 1.000    | 8763832      | 53.1            | 106  | 139658 |       |
| D 21 13C8 FOSA                        | 506.00 > 78.00  | 3.496  | 3.496  | 0.0    |          | 18135067     | 49.4            | 98.9 | 397582 |       |
| 22 Perfluorooctane Sulfonamide        | 498.00 > 78.00  | 3.505  | 3.505  | 0.0    | 1.000    | 17175157     | 52.7            | 105  | 427442 |       |
| D 26 M2-8:2FTS                        | 529.00 > 509.00 | 3.505  | 3.505  | 0.0    |          | 4953969      | 53.5            | 112  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane | 527.00 > 507.00 | 3.505  | 3.505  | 0.0    | 1.000    | 4601963      | 48.1            | 100  |        |       |
| D 23 13C2 PFDA                        | 515.00 > 470.00 | 3.522  | 3.522  | 0.0    |          | 7802371      | 46.8            | 93.6 | 169072 |       |
| 24 Perfluorodecanoic acid             | 513.00 > 469.00 | 3.522  | 3.522  | 0.0    | 1.000    | 7335741      | 51.9            | 104  | 229249 |       |
| D 27 d3-NMeFOSAA                      | 573.00 > 419.00 | 3.676  | 3.676  | 0.0    |          | 3926437      | 46.1            | 92.2 |        |       |
| 28 N-methyl perfluorooctane sulfonami | 570.00 > 419.00 | 3.676  | 3.676  | 0.0    | 1.000    | 3683847      | 48.3            | 96.6 |        |       |
| 29 Perfluorodecane Sulfonic acid      | 599.00 > 80.00  | 3.832  | 3.832  | 0.0    | 1.000    | 7498157      | 49.0            | 102  |        |       |
| D 32 d5-NEtFOSAA                      | 589.00 > 419.00 | 3.841  | 3.841  | 0.0    |          | 3658323      | 45.0            | 89.9 |        |       |
| D 30 13C2 PFUnA                       | 565.00 > 520.00 | 3.849  | 3.849  | 0.0    |          | 5903421      | 45.1            | 90.3 | 164657 |       |
| 33 N-ethyl perfluorooctane sulfonamid | 584.00 > 419.00 | 3.849  | 3.849  | 0.0    | 1.002    | 3221325      | 48.4            | 96.7 |        |       |
| 31 Perfluoroundecanoic acid           | 563.00 > 519.00 | 3.849  | 3.849  | 0.0    | 1.000    | 5654621      | 47.2            | 94.5 | 134860 |       |
| D 34 d-N-MeFOSA-M                     | 515.00 > 169.00 | 3.991  | 3.991  | 0.0    |          | 4317090      | 49.1            | 98.1 |        |       |
| 35 MeFOSA                             | 512.00 > 169.00 | 4.000  | 4.000  | 0.0    | 1.000    | 3931176      | 48.7            | 97.3 |        |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFD0A                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.135 | 4.135     | 0.0       |           | 5723395  | 46.2            |                 | 92.4 | 195802 |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 613.00 > 569.00                       | 4.142 | 4.142     | 0.0       | 1.000     | 5162738  | 49.3            |                 | 98.6 | 52193  |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.178 | 4.178     | 0.0       |           | 3867455  | 45.4            |                 | 90.7 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.185 | 4.185     | 0.0       | 1.000     | 3699227  | 48.6            |                 | 97.2 |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.398 | 4.398     | 0.0       | 1.000     | 5102349  | 51.0            |                 | 102  | 117510 |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.643 | 4.643     | 0.0       |           | 11671108 | 45.0            |                 | 90.1 | 282304 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.643 | 4.643     | 0.0       | 1.000     | 10257389 | 45.6            |                 | 91.1 | 134653 |       |
| 713.00 > 169.00                       | 4.633 | 4.643     | -0.010    | 0.998     | 1382003  |                 | 7.42(0.00-0.00) |      | 128117 |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.050 | 5.050     | 0.0       |           | 6006444  | 48.0            |                 | 96.1 | 105929 |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.050 | 5.050     | 0.0       | 1.000     | 4951894  | 46.3            |                 | 92.6 | 4962   |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.401 | 5.401     | 0.0       | 1.000     | 4010254  | 48.8            |                 | 97.7 | 5981   |       |

**QC Flag Legend**

## Processing Flags

NC - Not Calibrated

## Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L5\_00001

Amount Added: 1.00

Units: mL

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_024.d

Injection Date: 15-Mar-2017 20:08:47

Instrument ID: A8\_N

Lims ID: CCV L5

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 32

Worklist Smp#: 1

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

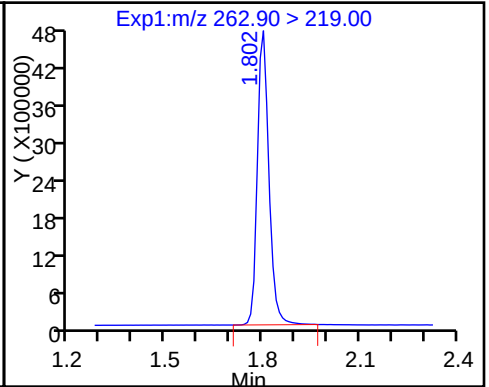
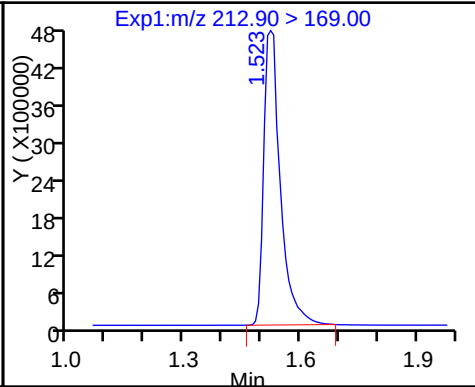
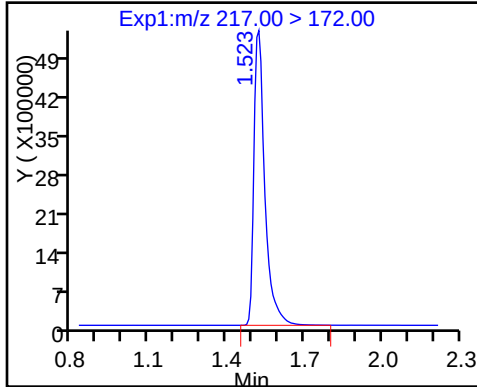
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

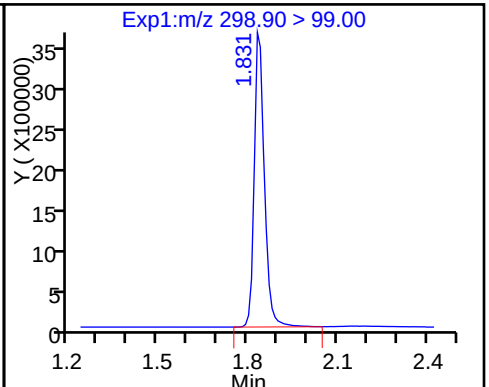
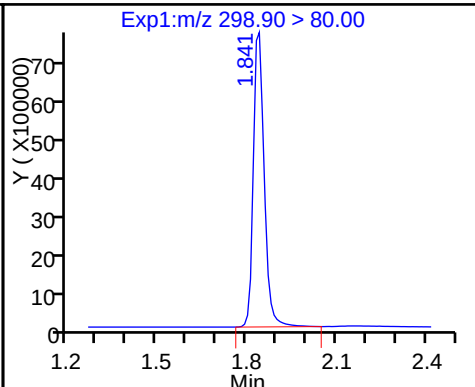
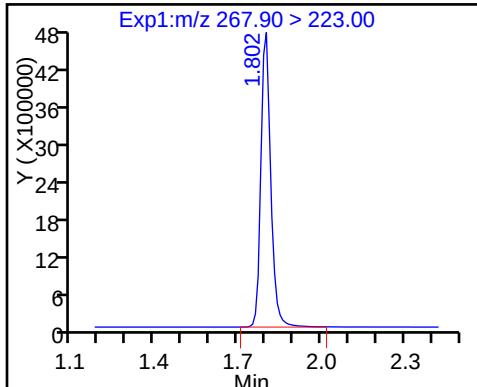
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

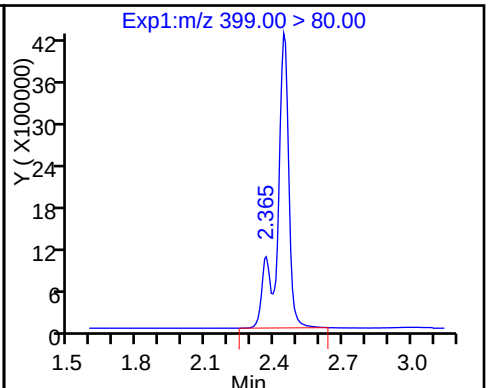
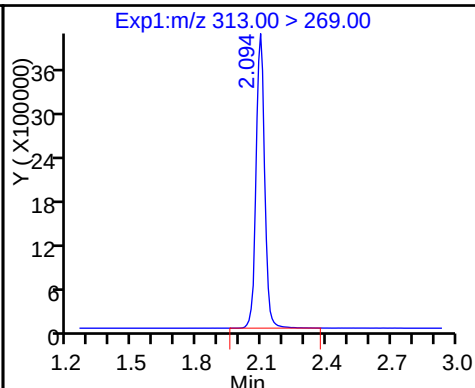
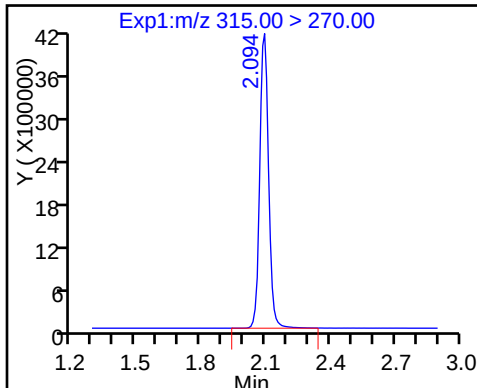
5 Perfluorobutanesulfonic acid



D 7 13C2 PFHxA

6 Perfluorohexanoic acid

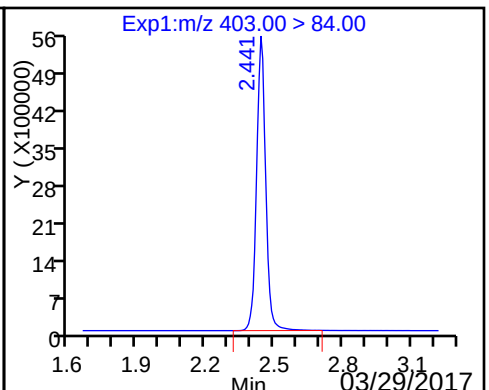
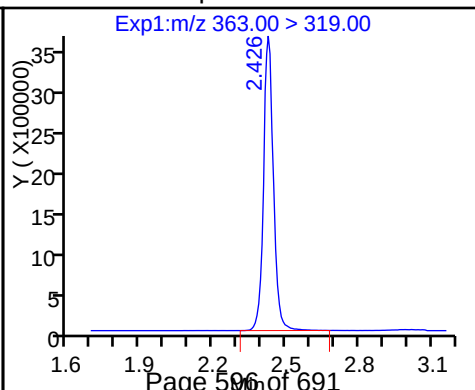
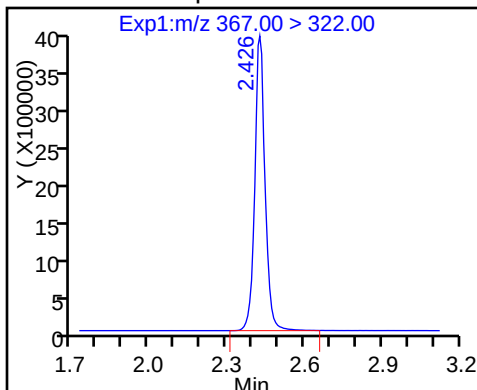
8 Perfluorohexanesulfonic acid



D 9 13C4-PFHpA

10 Perfluoroheptanoic acid

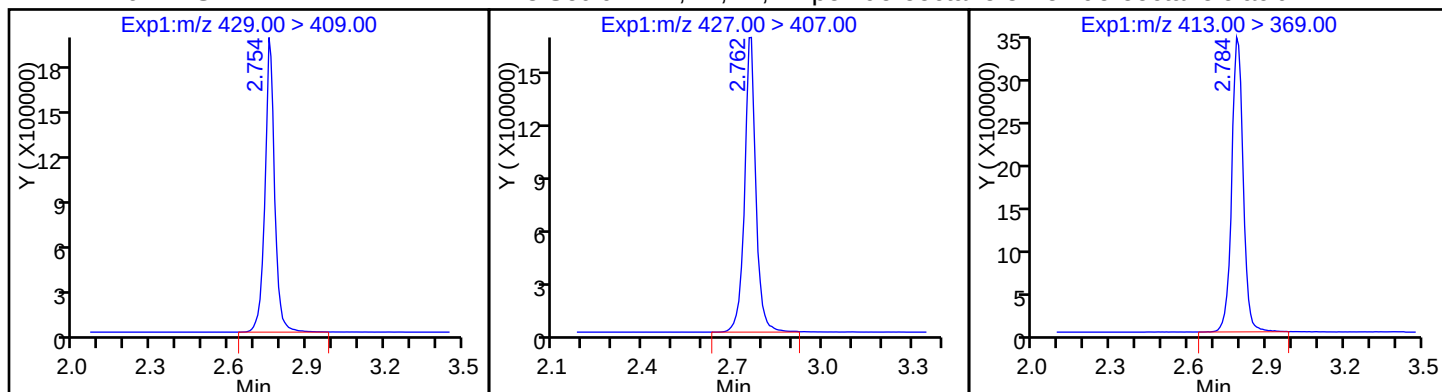
D 11 18O2 PFHxS



D 12 M2-6:2FTS

13 Sodium 1H,1H,2H,2H-perfluorooctanoate

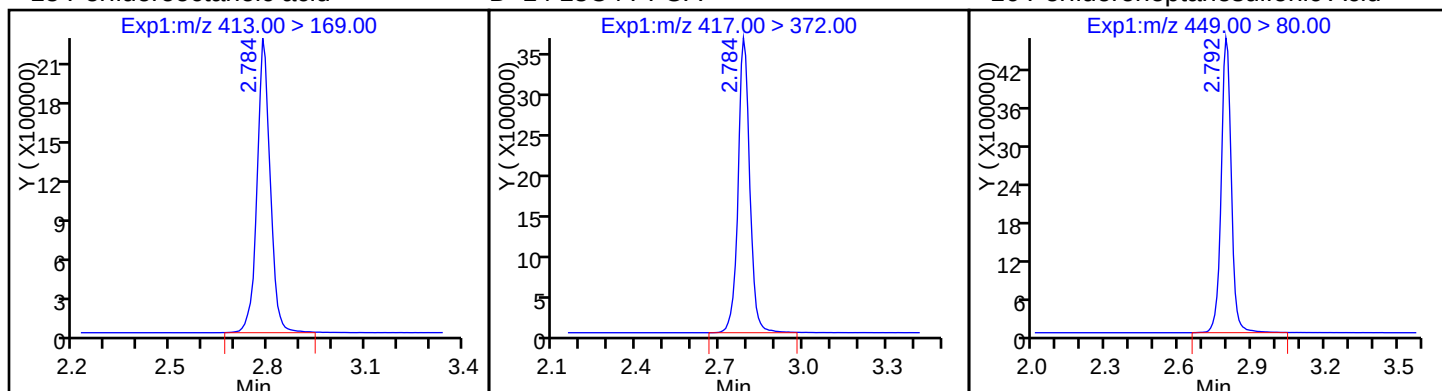
15 Perfluorooctanoic acid



15 Perfluorooctanoic acid

D 14 13C4 PFOA

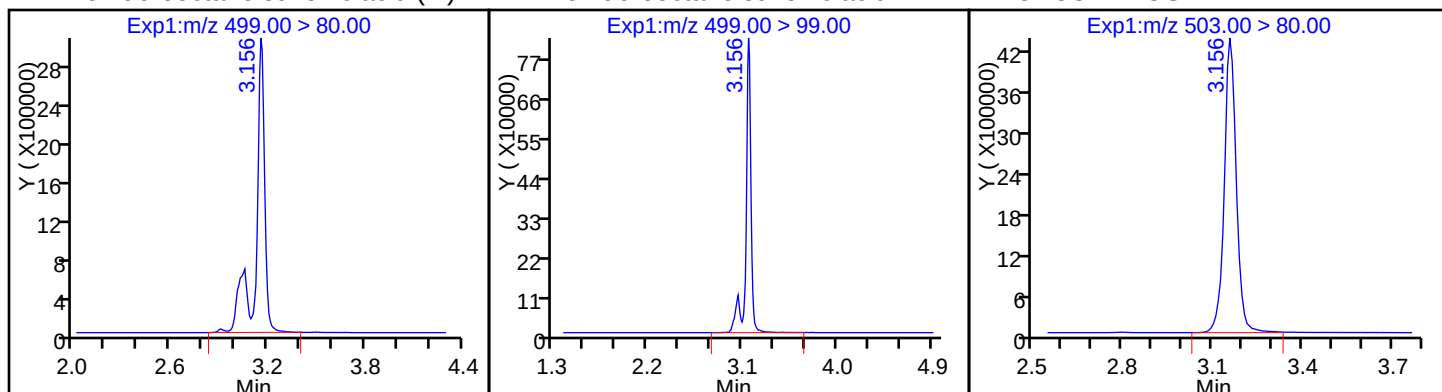
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid (M)

17 Perfluorooctane sulfonic acid

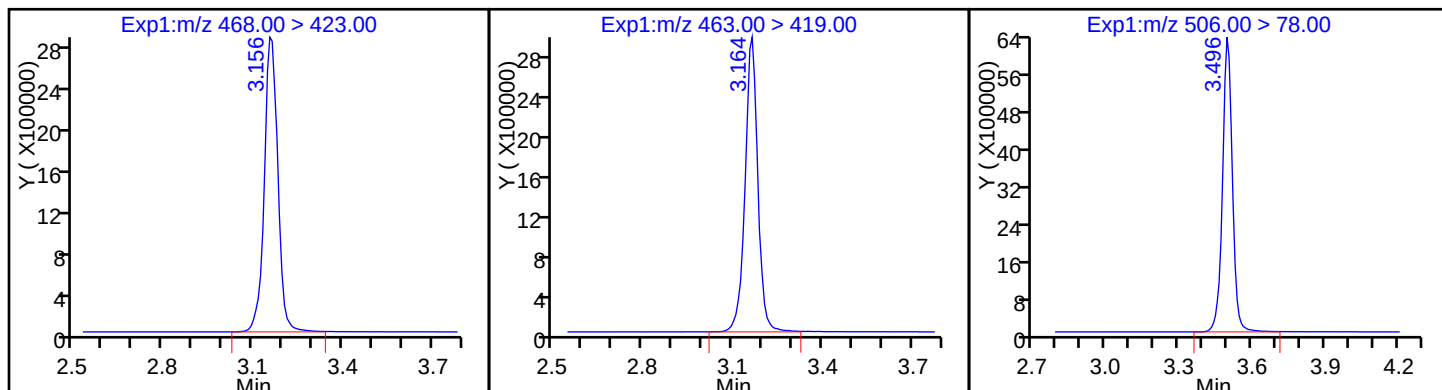
D 18 13C4 PFOS



D 19 13C5 PFNA

20 Perfluorononanoic acid

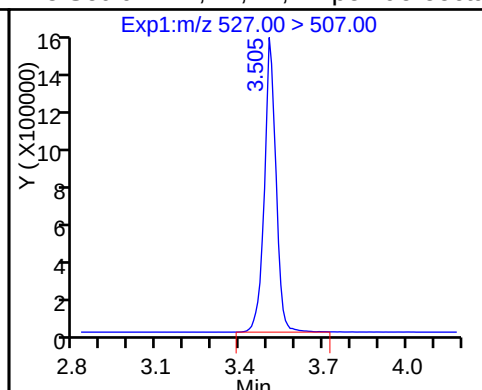
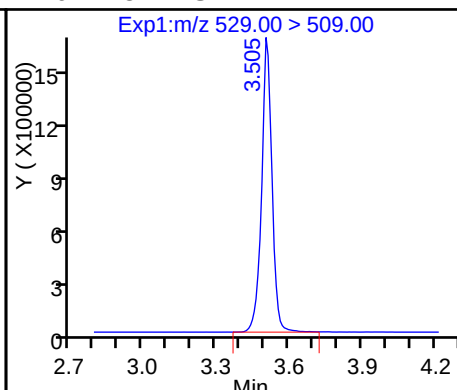
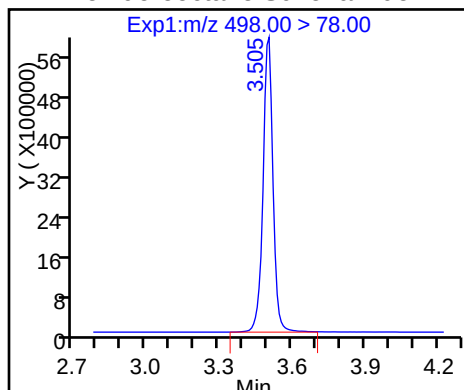
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

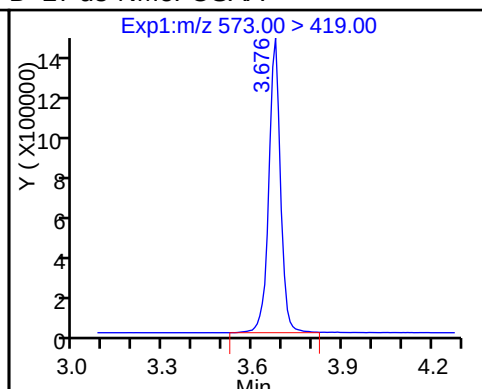
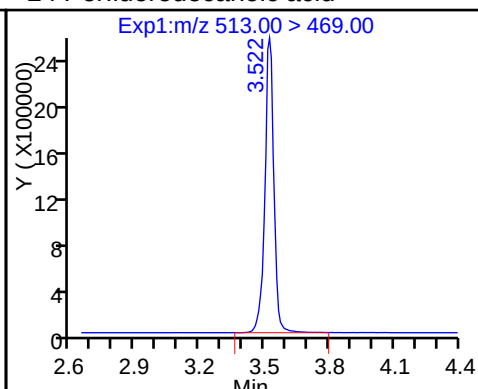
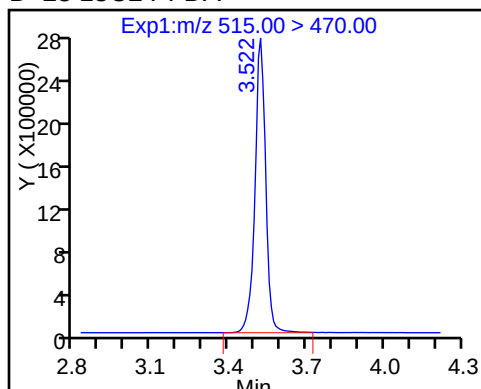
25 Sodium 1H,1H,2H,2H-perfluorooctane



D 23 13C2 PFDA

24 Perfluorodecanoic acid

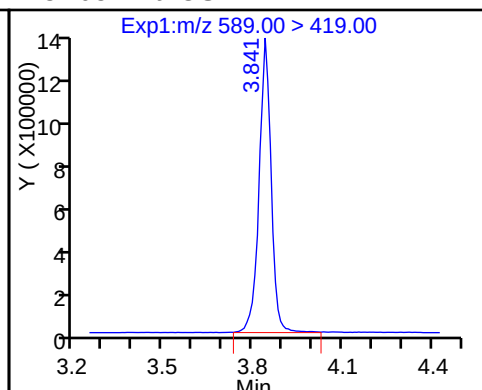
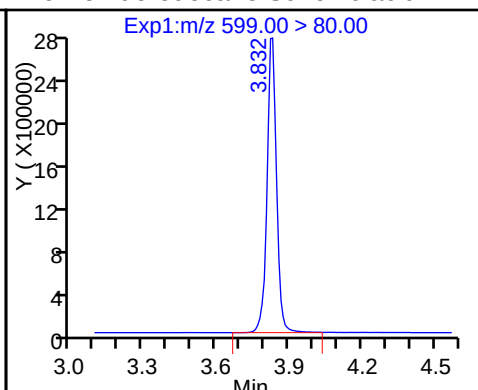
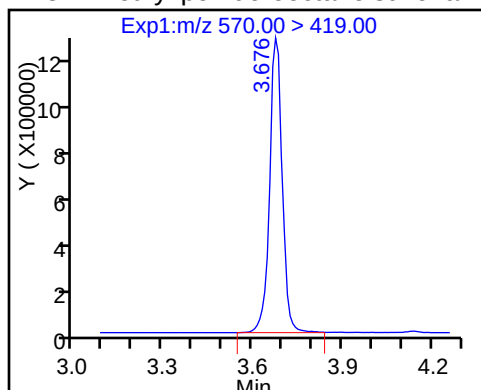
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

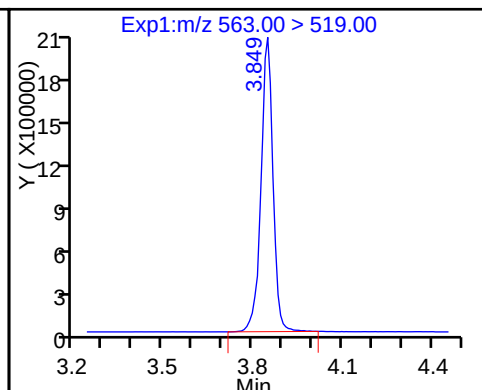
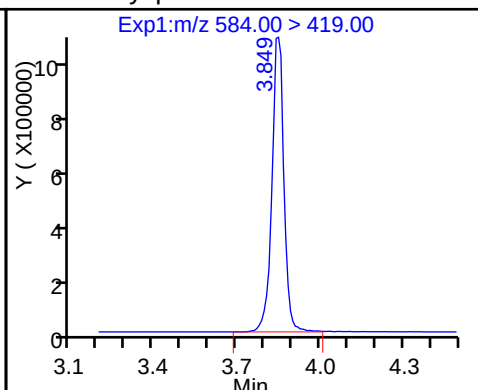
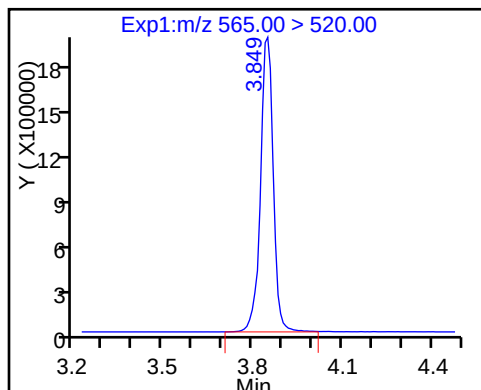
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

31 Perfluoroundecanoic acid

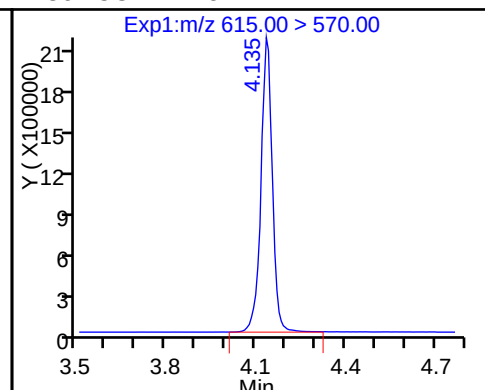
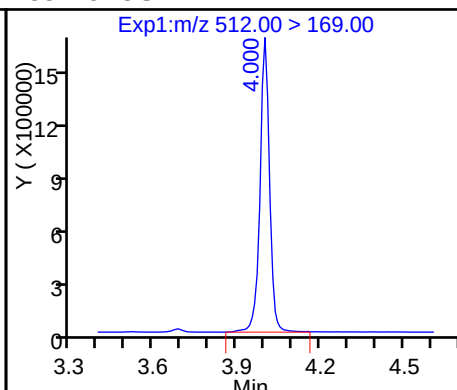
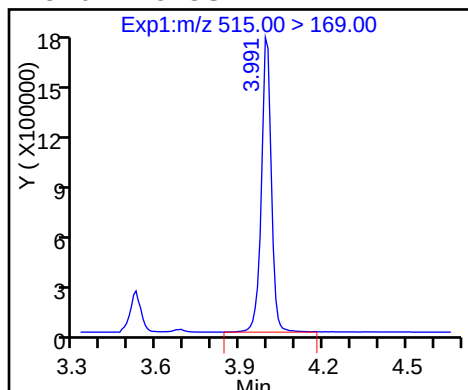




## D 34 d-N-MeFOSA-M

## 35 MeFOSA

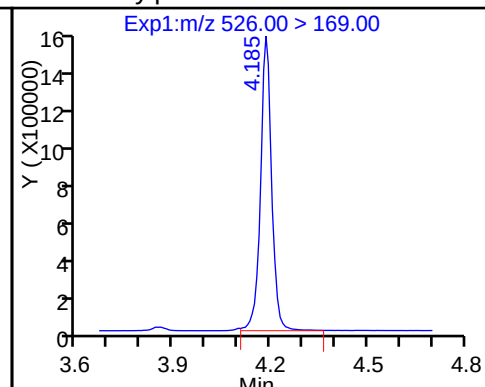
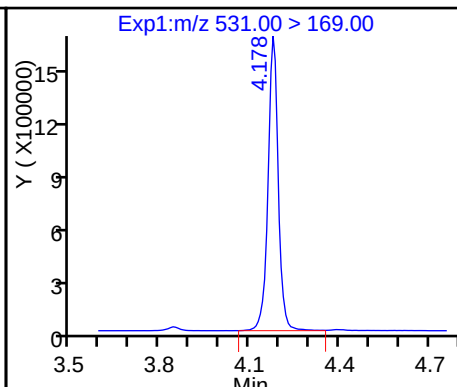
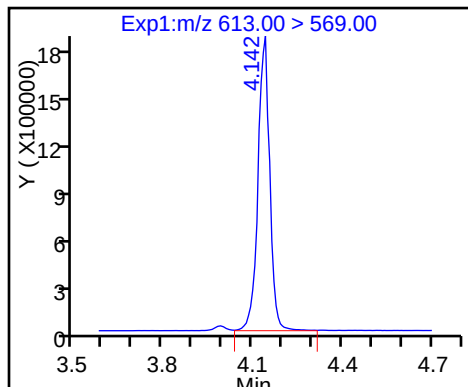
## D 36 13C2 PFDaA



## 37 Perfluorododecanoic acid

## D 38 d-N-EtFOSA-M

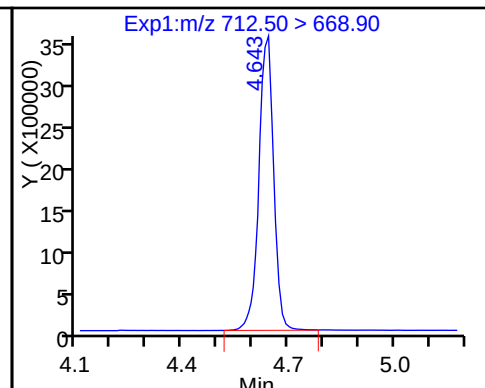
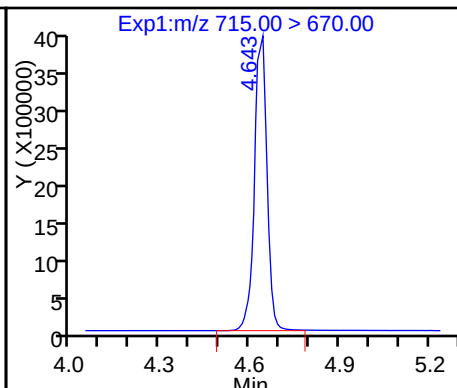
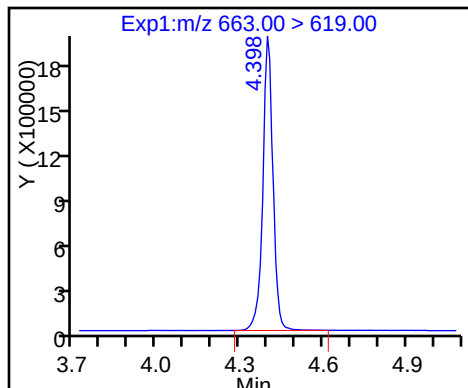
## 39 N-ethylperfluoro-1-octanesulfonami



## 41 Perfluorotridecanoic acid

## D 43 13C2-PFTeDA

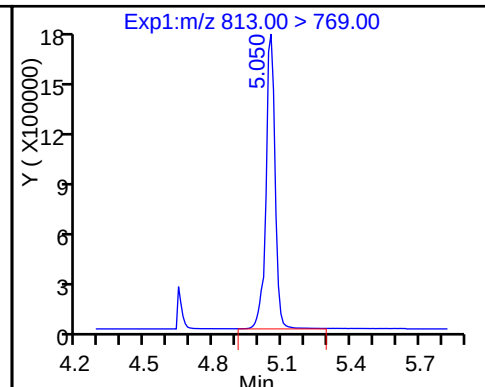
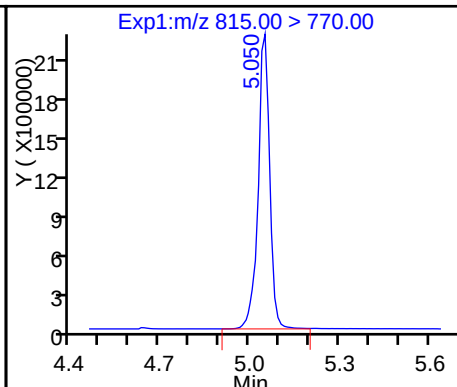
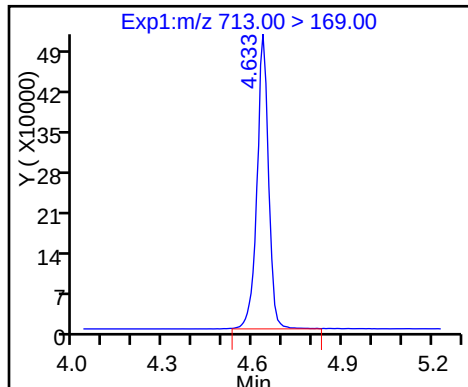
## 42 Perfluorotetradecanoic acid



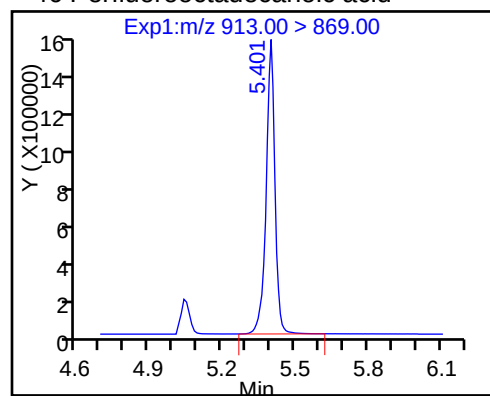
## 42 Perfluorotetradecanoic acid

## D 44 13C2-PFHxDA

## 45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

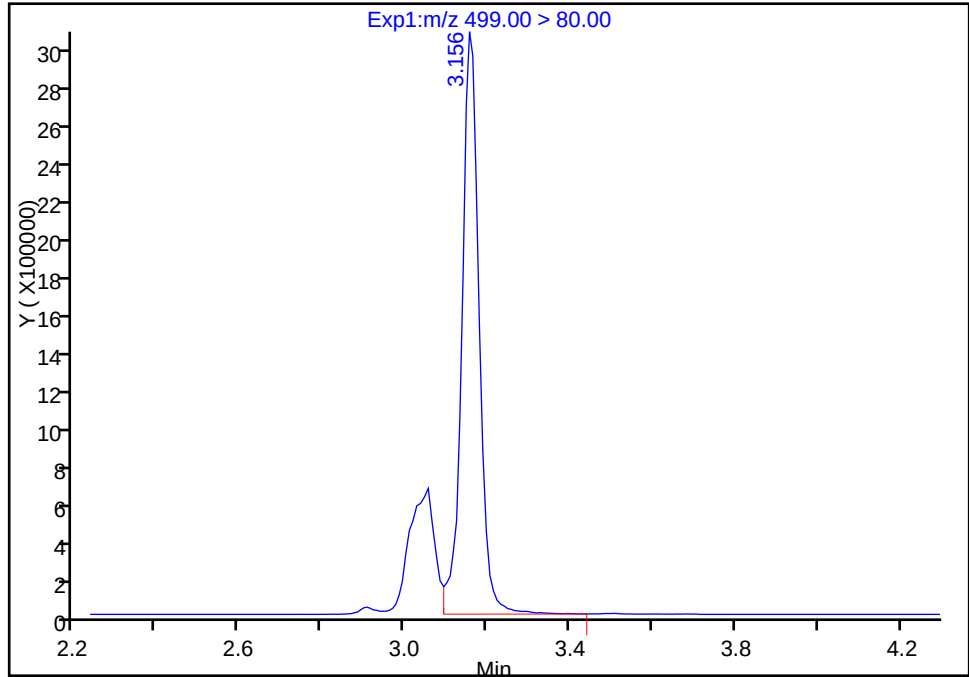
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_024.d  
Injection Date: 15-Mar-2017 20:08:47 Instrument ID: A8\_N  
Lims ID: CCV L5  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 32 Worklist Smp#: 1  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

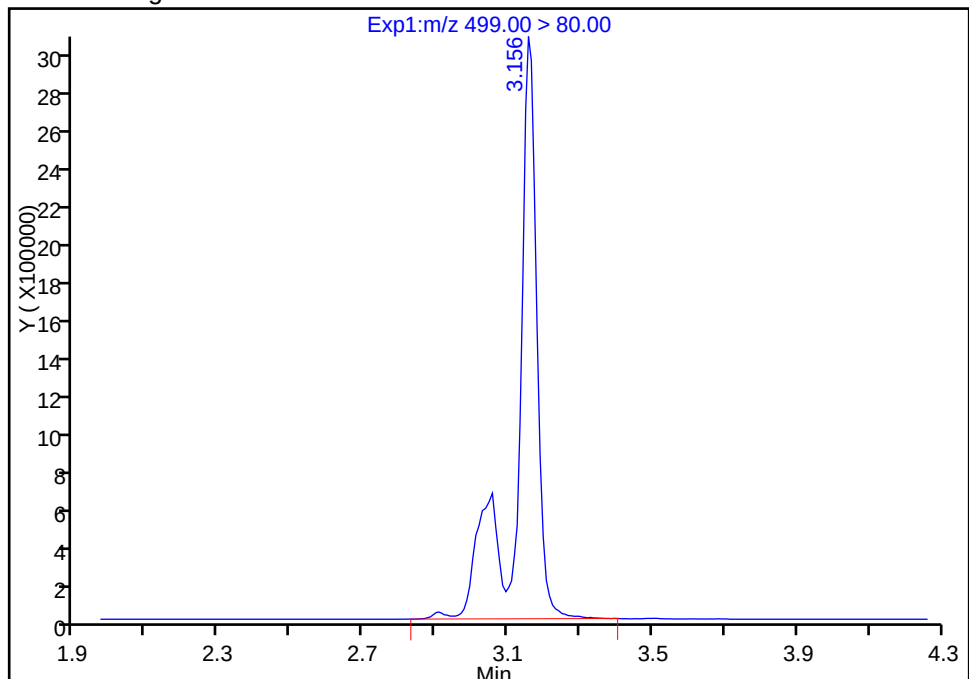
RT: 3.16  
Area: 8972369  
Amount: 35.498263  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.16  
Area: 11858831  
Amount: 46.918256  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 16-Mar-2017 11:48:40

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Lab Sample ID: CCV 320-155237/9 Calibration Date: 03/15/2017 21:08

Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08

GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46

Lab File ID: 2017.03.15D\_032.d Conc. Units: ng/mL

| ANALYTE                                                    | CURVE TYPE | AVE RRF | RRF    | MIN RRF | CALC AMOUNT | SPIKE AMOUNT | %D    | MAX %D |
|------------------------------------------------------------|------------|---------|--------|---------|-------------|--------------|-------|--------|
| Perfluorobutanoic acid (PFBA)                              | AveID      | 0.8473  | 0.8543 |         | 20.2        | 20.0         | 0.8   | 25.0   |
| Perfluoropentanoic acid (PFPeA)                            | AveID      | 0.9785  | 0.9638 |         | 19.7        | 20.0         | -1.5  | 25.0   |
| Perfluorobutanesulfonic acid (PFBS)                        | AveID      | 1.433   | 1.396  |         | 17.2        | 17.7         | -2.6  | 25.0   |
| Perfluorohexanoic acid (PFHxA)                             | AveID      | 0.8895  | 0.8662 |         | 19.5        | 20.0         | -2.6  | 25.0   |
| Perfluoroheptanoic acid (PFHpA)                            | AveID      | 0.9673  | 0.9122 |         | 18.9        | 20.0         | -5.7  | 25.0   |
| Perfluorohexanesulfonic acid (PFHxS)                       | AveID      | 1.028   | 0.9720 |         | 17.2        | 18.2         | -5.5  | 25.0   |
| 6:2FTS                                                     | L2ID       |         | 0.9190 |         | 19.5        | 19.0         | 3.0   | 25.0   |
| Perfluorooctanoic acid (PFOA)                              | AveID      | 1.022   | 0.9586 |         | 18.8        | 20.0         | -6.2  | 25.0   |
| Perfluoroheptanesulfonic Acid (PFHpS)                      | AveID      | 1.031   | 1.084  |         | 20.0        | 19.0         | 5.2   | 25.0   |
| Perfluorooctanesulfonic acid (PFOS)                        | AveID      | 0.9835  | 0.9529 |         | 18.0        | 18.6         | -3.1  | 25.0   |
| Perfluorononanoic acid (PFNA)                              | AveID      | 0.9040  | 0.9370 |         | 20.7        | 20.0         | 3.7   | 25.0   |
| Perfluorooctane Sulfonamide (FOSA)                         | AveID      | 0.8985  | 0.9016 |         | 20.1        | 20.0         | 0.3   | 25.0   |
| 8:2FTS                                                     | L2ID       |         | 0.9415 |         | 19.4        | 19.2         | 1.5   | 25.0   |
| Perfluorodecanoic acid (PFDA)                              | AveID      | 0.9057  | 0.8998 |         | 19.9        | 20.0         | -0.6  | 25.0   |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) | AveID      | 0.9711  | 0.9314 |         | 19.2        | 20.0         | -4.1  | 25.0   |
| Perfluorodecanesulfonic acid (PFDS)                        | AveID      | 0.5957  | 0.5522 |         | 17.9        | 19.3         | -7.3  | 25.0   |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)  | AveID      | 0.9103  | 0.8884 |         | 19.5        | 20.0         | -2.4  | 25.0   |
| Perfluoroundecanoic acid (PFUnA)                           | AveID      | 1.014   | 0.8761 |         | 17.3        | 20.0         | -13.6 | 25.0   |
| MeFOSA                                                     | AveID      | 0.9355  | 0.9078 |         | 19.4        | 20.0         | -3.0  | 25.0   |
| Perfluorododecanoic acid (PFDoA)                           | AveID      | 0.9145  | 0.8687 |         | 19.0        | 20.0         | -5.0  | 25.0   |
| N-EtFOSA-M                                                 | AveID      | 0.9837  | 0.9601 |         | 19.5        | 20.0         | -2.4  | 25.0   |
| Perfluorotridecanoic Acid (PFTriA)                         | AveID      | 0.8734  | 0.8448 |         | 19.3        | 20.0         | -3.3  | 25.0   |
| Perfluorotetradecanoic acid (PFTeA)                        | AveID      | 1.966   | 1.752  |         | 17.8        | 20.0         | -10.9 | 25.0   |
| Perfluoro-n-hexadecanoic acid (PFHxDA)                     | L1ID       |         | 0.8216 |         | 17.3        | 20.0         | -13.3 | 25.0   |
| Perfluoro-n-octadecanoic acid (PFODA)                      | AveID      | 0.7175  | 0.6901 |         | 19.2        | 20.0         | -3.8  | 25.0   |
| 13C4 PFBA                                                  | Ave        | 292242  | 317394 |         | 54.3        | 50.0         | 8.6   | 50.0   |
| 13C5-PFPeA                                                 | Ave        | 232192  | 244118 |         | 52.6        | 50.0         | 5.1   | 50.0   |
| 13C2 PFHxA                                                 | Ave        | 210884  | 231291 |         | 54.8        | 50.0         | 9.7   | 50.0   |
| 13C4-PFHpA                                                 | Ave        | 192959  | 217033 |         | 56.2        | 50.0         | 12.5  | 50.0   |
| 18O2 PFHxS                                                 | Ave        | 290899  | 325448 |         | 52.9        | 47.3         | 11.9  | 50.0   |
| M2-6:2FTS                                                  | Ave        | 77178   | 97830  |         | 60.2        | 47.5         | 26.8  | 50.0   |

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-155237/9 Calibration Date: 03/15/2017 21:08  
 Instrument ID: A8\_N Calib Start Date: 03/01/2017 11:08  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 03/01/2017 11:46  
 Lab File ID: 2017.03.15D\_032.d Conc. Units: ng/mL

| ANALYTE      | CURVE<br>TYPE | AVE CF | CF     | MIN CF | CALC<br>AMOUNT | SPIKE<br>AMOUNT | %D    | MAX<br>%D |
|--------------|---------------|--------|--------|--------|----------------|-----------------|-------|-----------|
| 13C4 PFOA    | Ave           | 204953 | 220073 |        | 53.7           | 50.0            | 7.4   | 50.0      |
| 13C4 PFOS    | Ave           | 241637 | 247094 |        | 48.9           | 47.8            | 2.3   | 50.0      |
| 13C5 PFNA    | Ave           | 177866 | 178104 |        | 50.1           | 50.0            | 0.1   | 50.0      |
| 13C8 FOSA    | Ave           | 366918 | 369441 |        | 50.3           | 50.0            | 0.7   | 50.0      |
| M2-8:2FTS    | Ave           | 92602  | 103519 |        | 53.5           | 47.9            | 11.8  | 50.0      |
| 13C2 PFDA    | Ave           | 166704 | 156686 |        | 47.0           | 50.0            | -6.0  | 50.0      |
| d3-NMeFOSAA  | Ave           | 85186  | 77986  |        | 45.8           | 50.0            | -8.5  | 50.0      |
| d5-NEtFOSAA  | Ave           | 81371  | 77311  |        | 47.5           | 50.0            | -5.0  | 50.0      |
| 13C2 PFUnA   | Ave           | 130805 | 122946 |        | 47.0           | 50.0            | -6.0  | 50.0      |
| d-N-MeFOSA-M | Ave           | 87983  | 86625  |        | 49.2           | 50.0            | -1.5  | 50.0      |
| 13C2 PFDoA   | Ave           | 123944 | 108156 |        | 43.6           | 50.0            | -12.7 | 50.0      |
| d-N-EtFOSA-M | Ave           | 85249  | 77677  |        | 45.6           | 50.0            | -8.9  | 50.0      |
| 13C2-PFTeDA  | Ave           | 259165 | 215570 |        | 41.6           | 50.0            | -16.8 | 50.0      |
| 13C2-PFHxDA  | Ave           | 125061 | 106243 |        | 42.5           | 50.0            | -15.0 | 50.0      |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d  
 Lims ID: CCV L4  
 Client ID:  
 Sample Type: CCV  
 Inject. Date: 15-Mar-2017 21:08:52 ALS Bottle#: 31 Worklist Smp#: 9  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: CCV L4  
 Misc. Info.: Plate: 1 Rack: 1  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Sublist: chrom-A8\_N\*sub14  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 16-Mar-2017 11:49:47 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last Ical File: \\ChromNa\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d

Column 1 : Det: EXP1

Process Host: XAWRK027

First Level Reviewer: chandrasenas

Date: 16-Mar-2017 11:48:28

| Signal                         | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N     | Flags |
|--------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|---------|-------|
| D 1 13C4 PFBA                  |       |        |        |        |          |              |                 |      |         |       |
| 217.00 > 172.00                | 1.523 | 1.523  | 0.0    |        | 15869693 | 54.3         |                 | 109  | 1366310 |       |
| 2 Perfluorobutyric acid        |       |        |        |        |          |              |                 |      |         |       |
| 212.90 > 169.00                | 1.523 | 1.523  | 0.0    | 1.000  | 5422881  | 20.2         |                 | 101  | 49268   |       |
| 4 Perfluoropentanoic acid      |       |        |        |        |          |              |                 |      |         |       |
| 262.90 > 219.00                | 1.802 | 1.802  | 0.0    | 1.000  | 4705722  | 19.7         |                 | 98.5 | 50681   |       |
| D 3 13C5-PFPeA                 |       |        |        |        |          |              |                 |      |         |       |
| 267.90 > 223.00                | 1.802 | 1.802  | 0.0    |        | 12205912 | 52.6         |                 | 105  | 816750  |       |
| D 47 13C3-PFBS                 |       |        |        |        |          |              |                 |      |         |       |
| 301.90 > 83.00                 | 1.832 | 1.832  | 0.0    |        | 305051   | NC           |                 |      |         |       |
| 5 Perfluorobutanesulfonic acid |       |        |        |        |          |              |                 |      |         |       |
| 298.90 > 80.00                 | 1.842 | 1.842  | 0.0    | 1.000  | 8030323  | 17.2         |                 | 97.4 |         |       |
| 298.90 > 99.00                 | 1.842 | 1.842  | 0.0    | 1.000  | 3265352  |              | 2.46(0.00-0.00) |      |         |       |
| D 7 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |         |       |
| 315.00 > 270.00                | 2.097 | 2.097  | 0.0    |        | 11564574 | 54.8         |                 | 110  | 530028  |       |
| 6 Perfluorohexanoic acid       |       |        |        |        |          |              |                 |      |         |       |
| 313.00 > 269.00                | 2.097 | 2.097  | 0.0    | 1.000  | 4006734  | 19.5         |                 | 97.4 | 136016  |       |
| 10 Perfluoroheptanoic acid     |       |        |        |        |          |              |                 |      |         |       |
| 363.00 > 319.00                | 2.426 | 2.426  | 0.0    | 1.000  | 3959730  | 18.9         |                 | 94.3 | 51234   |       |
| D 9 13C4-PFHpA                 |       |        |        |        |          |              |                 |      |         | M     |
| 367.00 > 322.00                | 2.433 | 2.433  | 0.0    |        | 10851641 | 56.2         |                 | 112  | 425761  | M     |
| D 11 18O2 PFHxS                |       |        |        |        |          |              |                 |      |         |       |
| 403.00 > 84.00                 | 2.441 | 2.441  | 0.0    |        | 15393685 | 52.9         |                 | 112  | 412085  |       |
| 8 Perfluorohexanesulfonic acid |       |        |        |        |          |              |                 |      |         | M     |
| 399.00 > 80.00                 | 2.449 | 2.449  | 0.0    | 1.000  | 5757306  | 17.2         |                 | 94.5 |         | M     |
| D 12 M2-6:2FTS                 |       |        |        |        |          |              |                 |      |         |       |
| 429.00 > 409.00                | 2.761 | 2.761  | 0.0    |        | 4646945  | 60.2         |                 | 127  |         |       |

| Signal                                | RT              | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-----------------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 13 Sodium 1H,1H,2H,2H-perfluorooctane | 427.00 > 407.00 | 2.761  | 2.761  | 0.0    | 1.000    | 1704610      | 19.5            | 103  |        |       |
| 15 Perfluorooctanoic acid             | 413.00 > 369.00 | 2.783  | 2.783  | 0.0    | 1.000    | 4219069      | 18.8            | 93.8 | 53356  |       |
|                                       | 413.00 > 169.00 | 2.791  | 2.783  | 0.008  | 1.003    | 2431684      | 1.74(0.90-1.10) |      | 71719  |       |
| D 14 13C4 PFOA                        | 417.00 > 372.00 | 2.791  | 2.791  | 0.0    |          | 11003664     | 53.7            | 107  | 303115 |       |
| 16 Perfluoroheptanesulfonic Acid      | 449.00 > 80.00  | 2.791  | 2.791  | 0.0    | 1.000    | 5100867      | 20.0            | 105  |        |       |
| 17 Perfluorooctane sulfonic acid      | 499.00 > 80.00  | 3.156  | 3.156  | 0.0    | 1.000    | 4370272      | 18.0            | 96.9 | 125390 | M     |
|                                       | 499.00 > 99.00  | 3.156  | 3.156  | 0.0    | 1.000    | 990463       | 4.41(0.90-1.10) |      | 35715  | M     |
| D 18 13C4 PFOS                        | 503.00 > 80.00  | 3.156  | 3.156  | 0.0    |          | 11811117     | 48.9            | 102  | 264503 |       |
| D 19 13C5 PFNA                        | 468.00 > 423.00 | 3.164  | 3.164  | 0.0    |          | 8905185      | 50.1            | 100  | 344696 |       |
| 20 Perfluorononanoic acid             | 463.00 > 419.00 | 3.164  | 3.164  | 0.0    | 1.000    | 3337784      | 20.7            | 104  | 68739  |       |
| D 21 13C8 FOSA                        | 506.00 > 78.00  | 3.494  | 3.494  | 0.0    |          | 18472059     | 50.3            | 101  | 425707 |       |
| 22 Perfluorooctane Sulfonamide        | 498.00 > 78.00  | 3.494  | 3.494  | 0.0    | 1.000    | 6661546      | 20.1            | 100  | 256480 |       |
| D 26 M2-8:2FTS                        | 529.00 > 509.00 | 3.503  | 3.503  | 0.0    |          | 4958575      | 53.5            | 112  |        |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane | 527.00 > 507.00 | 3.503  | 3.503  | 0.0    | 1.000    | 1867470      | 19.4            | 101  |        |       |
| D 23 13C2 PFDA                        | 515.00 > 470.00 | 3.511  | 3.511  | 0.0    |          | 7834310      | 47.0            | 94.0 | 153712 |       |
| 24 Perfluorodecanoic acid             | 513.00 > 469.00 | 3.511  | 3.511  | 0.0    | 1.000    | 2819853      | 19.9            | 99.4 | 108788 |       |
| D 27 d3-NMeFOSAA                      | 573.00 > 419.00 | 3.664  | 3.664  | 0.0    |          | 3899288      | 45.8            | 91.5 |        |       |
| 28 N-methyl perfluorooctane sulfonami | 570.00 > 419.00 | 3.674  | 3.674  | 0.0    | 1.003    | 1452766      | 19.2            | 95.9 |        |       |
| 29 Perfluorodecane Sulfonic acid      | 599.00 > 80.00  | 3.821  | 3.821  | 0.0    | 1.000    | 2630471      | 17.9            | 92.7 |        |       |
| D 32 d5-NEtFOSAA                      | 589.00 > 419.00 | 3.830  | 3.830  | 0.0    |          | 3865529      | 47.5            | 95.0 |        |       |
| D 30 13C2 PFUnA                       | 565.00 > 520.00 | 3.839  | 3.839  | 0.0    |          | 6147300      | 47.0            | 94.0 | 291050 |       |
| 33 N-ethyl perfluorooctane sulfonamid | 584.00 > 419.00 | 3.839  | 3.839  | 0.0    | 1.002    | 1373584      | 19.5            | 97.6 |        |       |
| 31 Perfluoroundecanoic acid           | 563.00 > 519.00 | 3.839  | 3.839  | 0.0    | 1.000    | 2154278      | 17.3            | 86.4 | 53502  |       |
| D 34 d-N-MeFOSA-M                     | 515.00 > 169.00 | 3.988  | 3.988  | 0.0    |          | 4331233      | 49.2            | 98.5 |        |       |
| 35 MeFOSA                             | 512.00 > 169.00 | 3.988  | 3.988  | 0.0    | 1.000    | 1572754      | 19.4            | 97.0 |        |       |

| Signal                                | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 36 13C2 PFDaA                       |       |           |           |           |          |                 |                 |      |        |       |
| 615.00 > 570.00                       | 4.123 | 4.123     | 0.0       |           | 5407816  | 43.6            |                 | 87.3 | 130878 |       |
| 37 Perfluorododecanoic acid           |       |           |           |           |          |                 |                 |      |        |       |
| 613.00 > 569.00                       | 4.123 | 4.123     | 0.0       | 1.000     | 1879003  | 19.0            |                 | 95.0 | 19364  |       |
| D 38 d-N-EtFOSA-M                     |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                       | 4.166 | 4.166     | 0.0       |           | 3883871  | 45.6            |                 | 91.1 |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |           |           |           |          |                 |                 |      |        |       |
| 526.00 > 169.00                       | 4.173 | 4.173     | 0.0       | 1.000     | 1491598  | 19.5            |                 | 97.6 |        |       |
| 41 Perfluorotridecanoic acid          |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                       | 4.393 | 4.393     | 0.0       | 1.000     | 1827487  | 19.3            |                 | 96.7 | 35447  |       |
| D 43 13C2-PFTeDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                       | 4.617 | 4.617     | 0.0       |           | 10778520 | 41.6            |                 | 83.2 | 223018 |       |
| 42 Perfluorotetradecanoic acid        |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                       | 4.624 | 4.624     | 0.0       | 1.000     | 3789697  | 17.8            |                 | 89.1 | 53289  |       |
| 713.00 > 169.00                       | 4.624 | 4.624     | 0.0       | 1.000     | 525676   |                 | 7.21(0.00-0.00) |      | 97491  |       |
| D 44 13C2-PFHxDA                      |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                       | 5.037 | 5.037     | 0.0       |           | 5312137  | 42.5            |                 | 85.0 | 84773  |       |
| 45 Perfluorohexadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                       | 5.037 | 5.037     | 0.0       | 1.000     | 1777120  | 17.3            |                 | 86.7 | 2709   |       |
| 46 Perfluorooctadecanoic acid         |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                       | 5.391 | 5.391     | 0.0       | 1.000     | 1492802  | 19.2            |                 | 96.2 | 1674   |       |

**QC Flag Legend**

## Processing Flags

NC - Not Calibrated

## Review Flags

M - Manually Integrated

**Reagents:**

LCPFC\_FULL-L4\_00001

Amount Added: 1.00

Units: mL



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d

Injection Date: 15-Mar-2017 21:08:52

Instrument ID: A8\_N

Lims ID: CCV L4

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 31

Worklist Smp#: 9

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

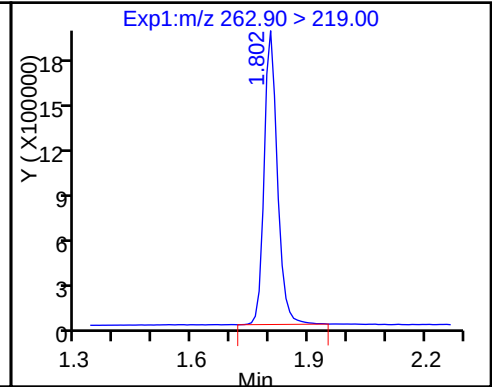
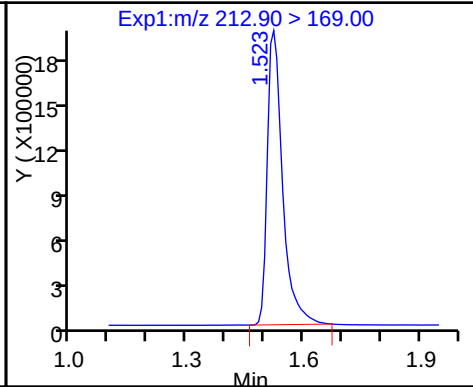
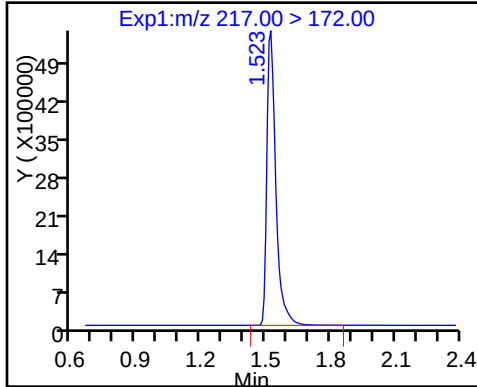
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

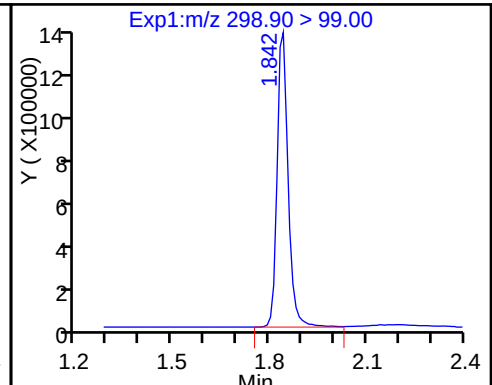
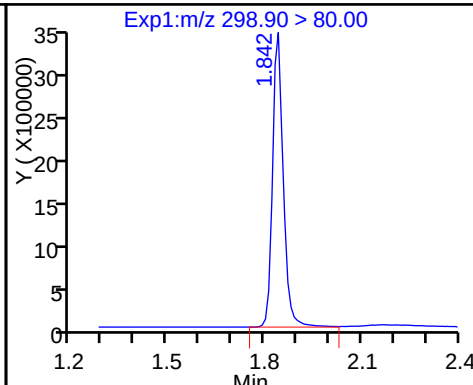
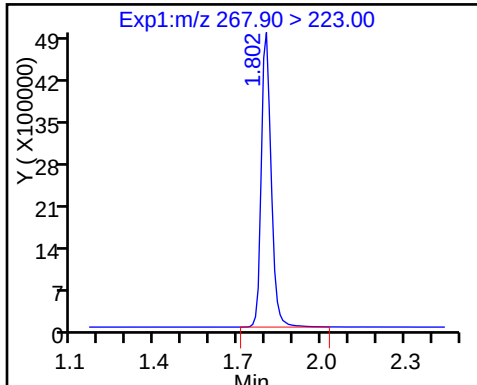
4 Perfluoropentanoic acid



D 3 13C5-PFPeA

5 Perfluorobutanesulfonic acid

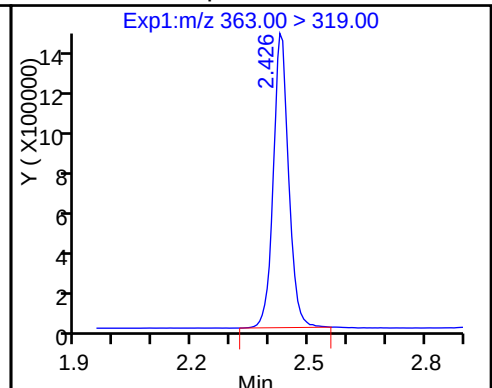
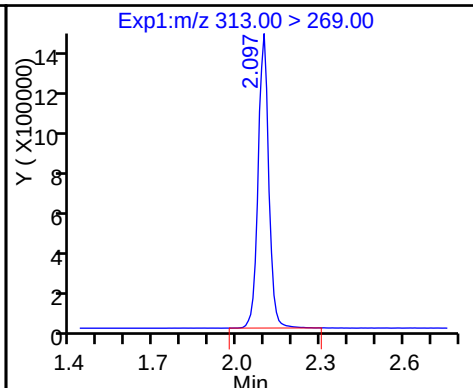
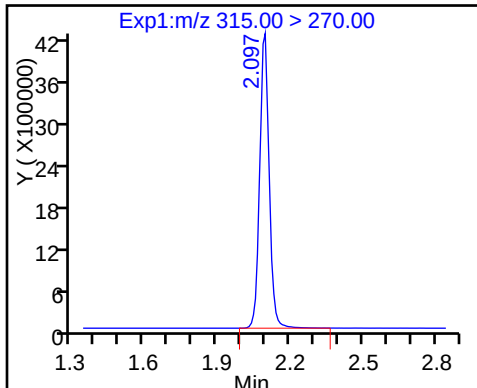
5 Perfluorobutanesulfonic acid



D 7 13C2 PFHxA

6 Perfluorohexanoic acid

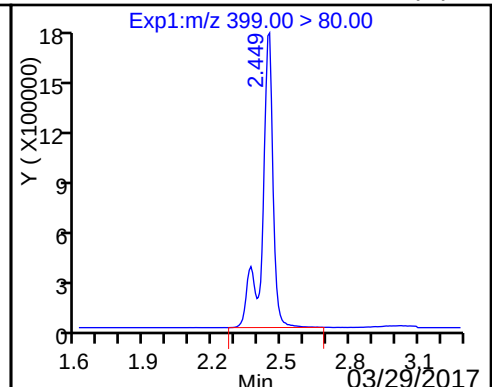
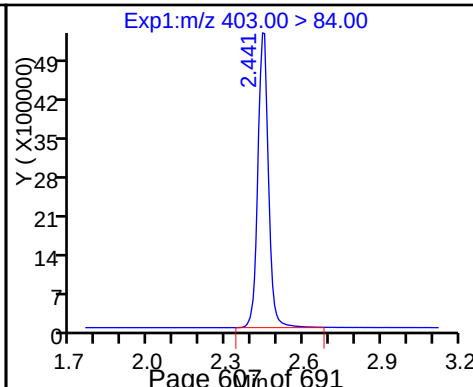
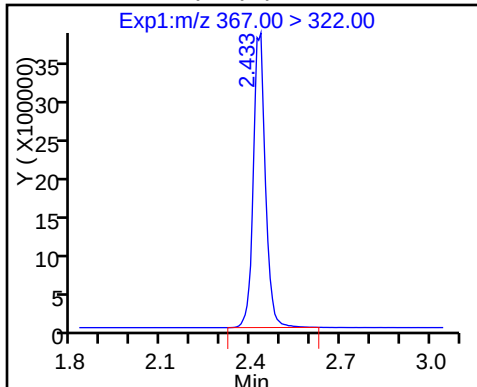
10 Perfluoroheptanoic acid



D 9 13C4-PFHpA (M)

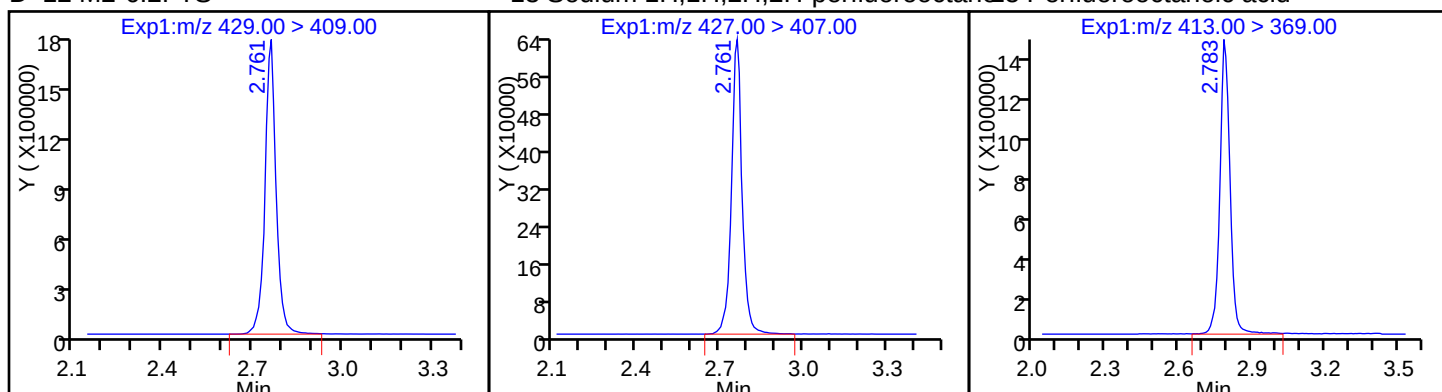
D 11 18O2 PFHxS

8 Perfluorohexanesulfonic acid (M)



D 12 M2-6:2FTS

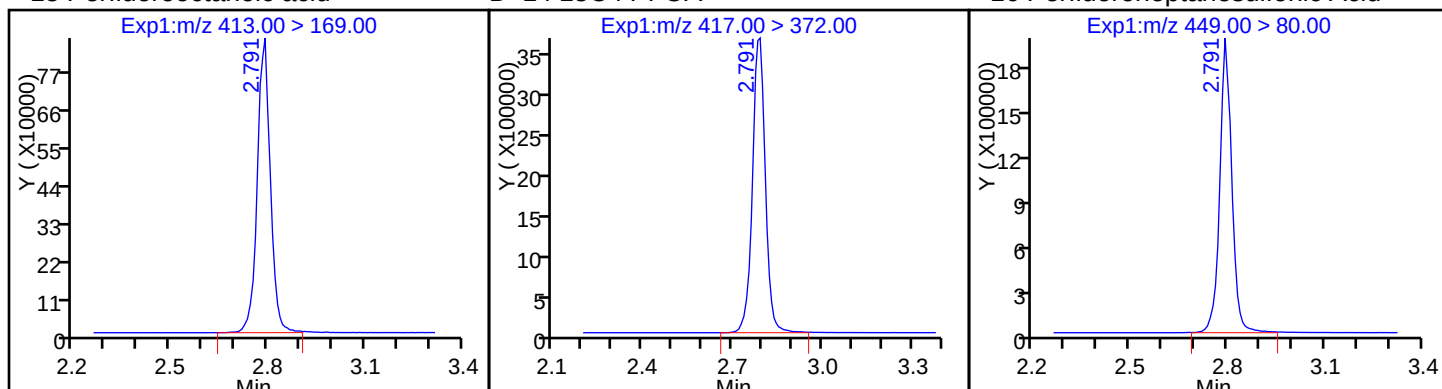
13 Sodium 1H,1H,2H,2H-perfluorooctanoate



15 Perfluorooctanoic acid

D 14 13C4 PFOA

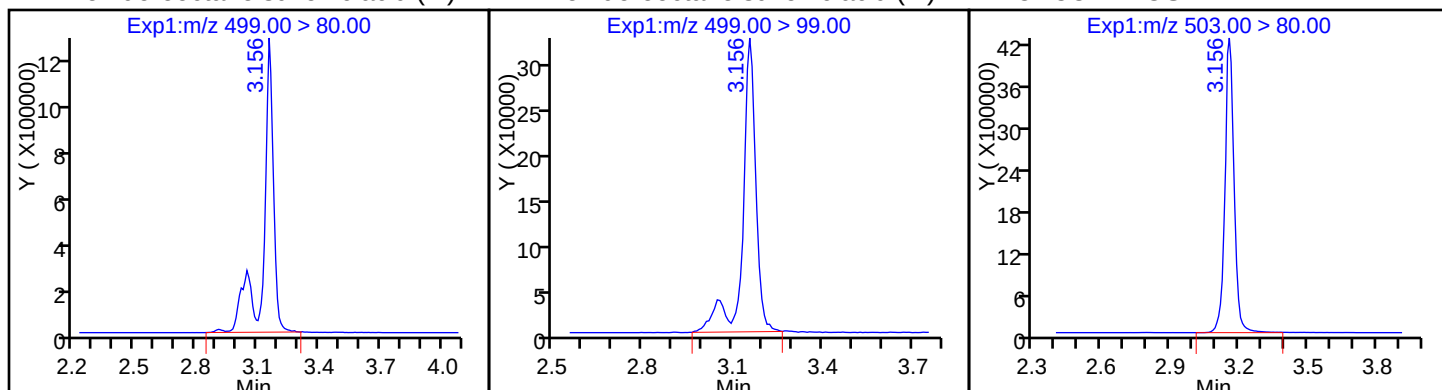
16 Perfluoroheptanesulfonic Acid



17 Perfluorooctane sulfonic acid (M)

17 Perfluorooctane sulfonic acid (M)

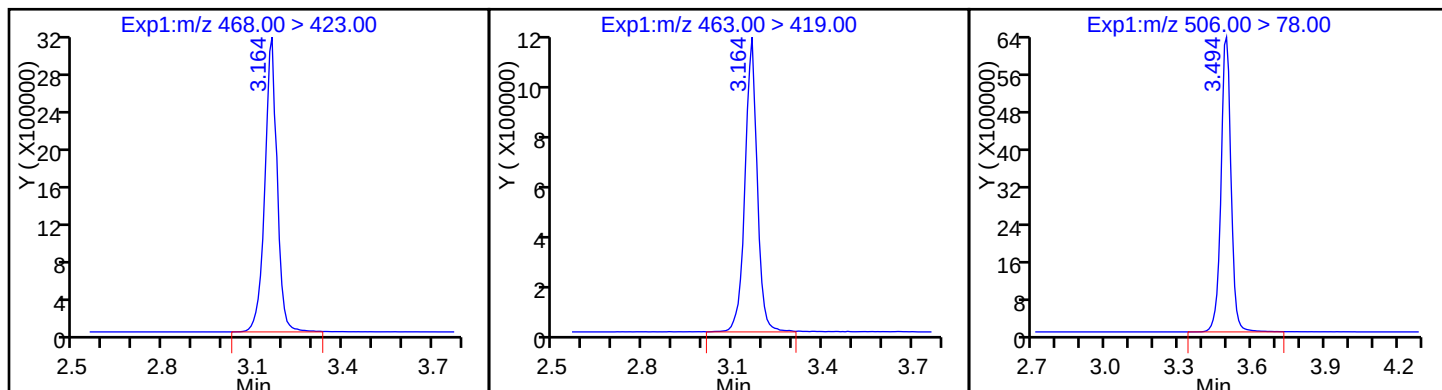
D 18 13C4 PFOS



D 19 13C5 PFNA

20 Perfluorononanoic acid

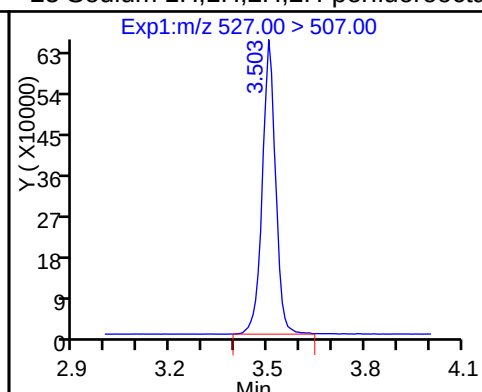
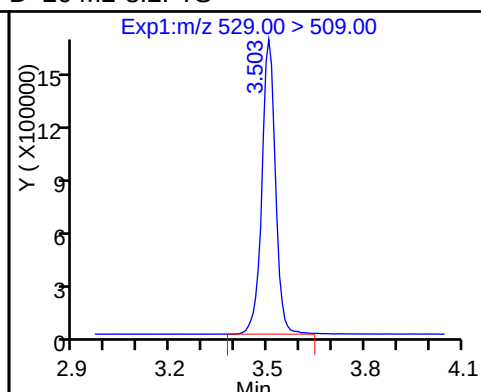
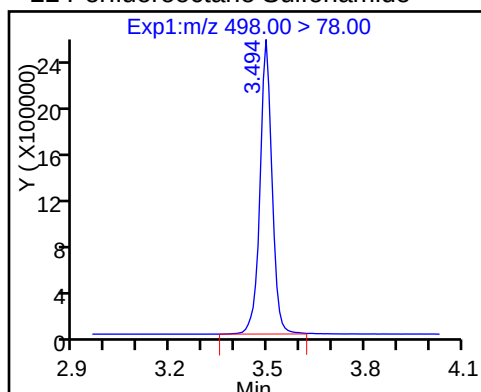
D 21 13C8 FOSA



22 Perfluorooctane Sulfonamide

D 26 M2-8:2FTS

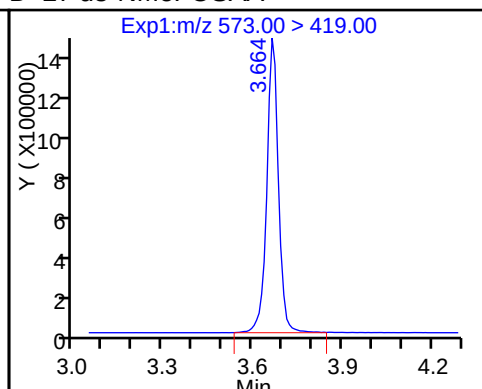
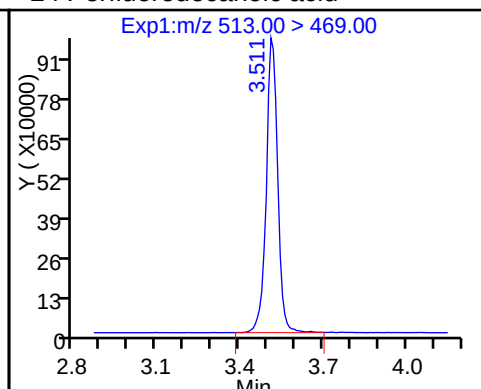
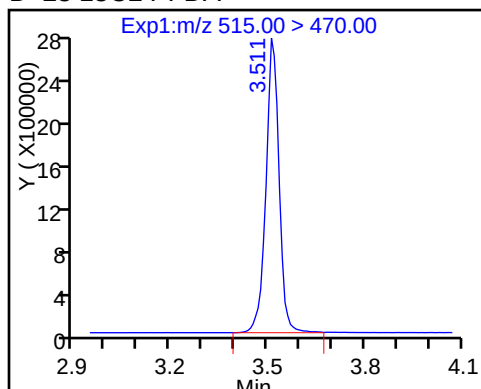
25 Sodium 1H,1H,2H,2H-perfluorooctane



D 23 13C2 PFDA

24 Perfluorodecanoic acid

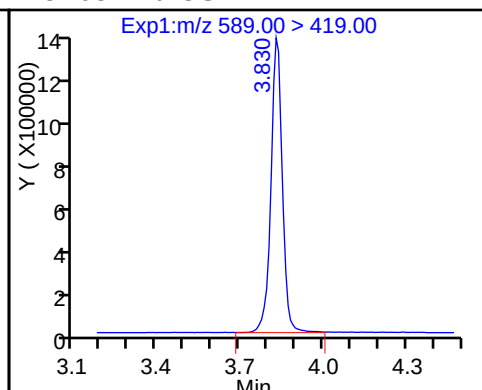
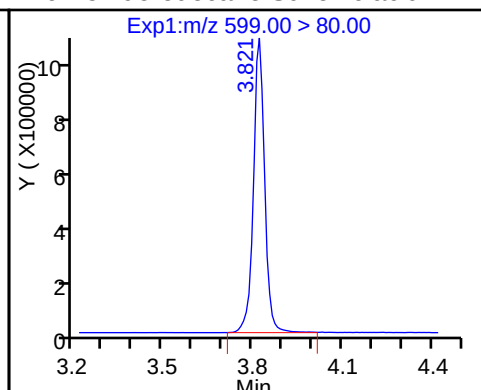
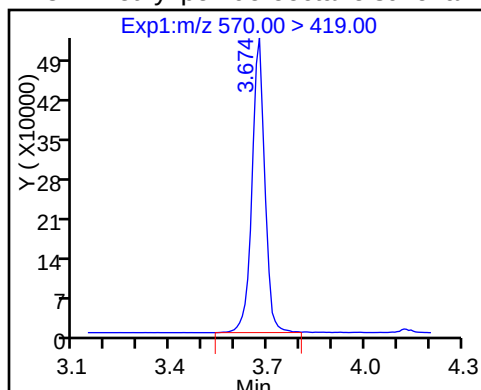
D 27 d3-NMeFOSAA



28 N-methyl perfluorooctane sulfonami

29 Perfluorodecane Sulfonic acid

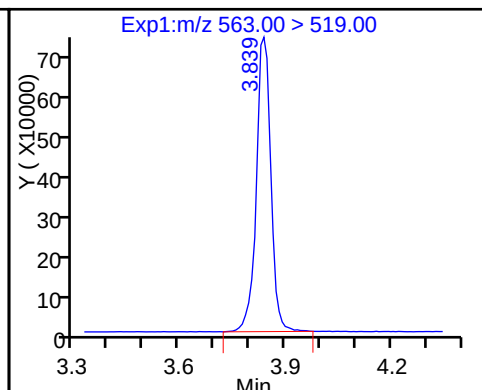
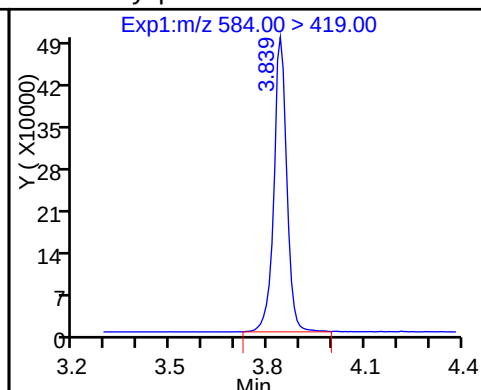
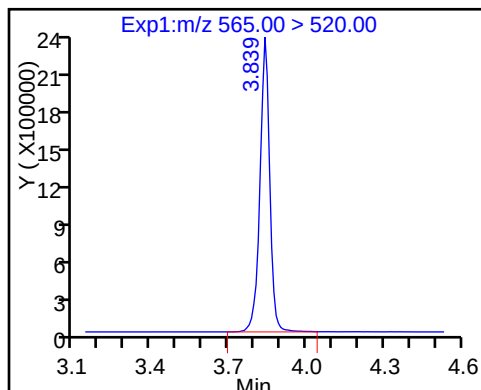
D 32 d5-NEtFOSAA



D 30 13C2 PFUnA

33 N-ethyl perfluorooctane sulfonamid

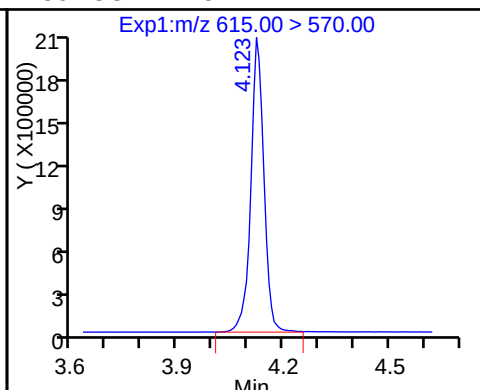
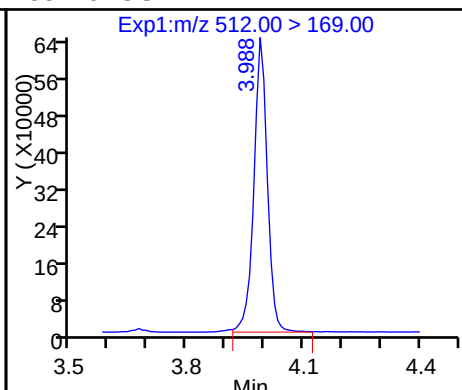
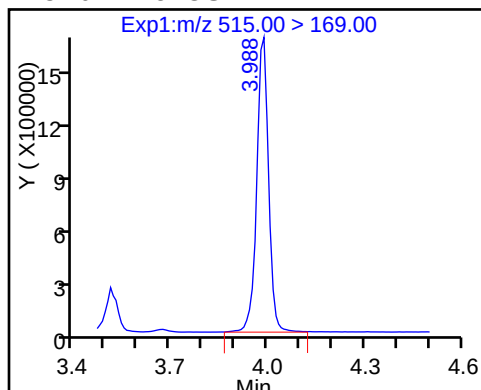
31 Perfluoroundecanoic acid



## D 34 d-N-MeFOSA-M

## 35 MeFOSA

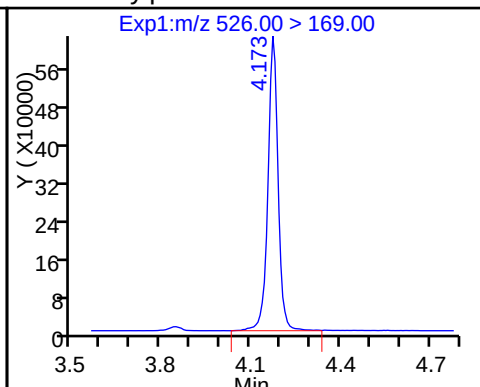
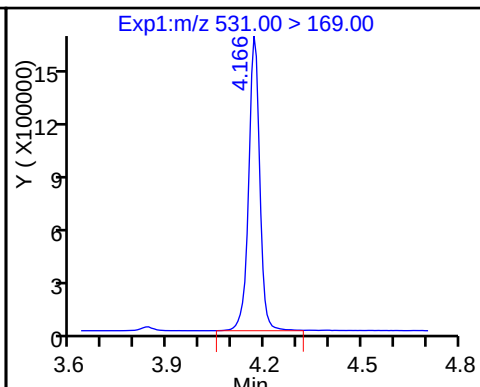
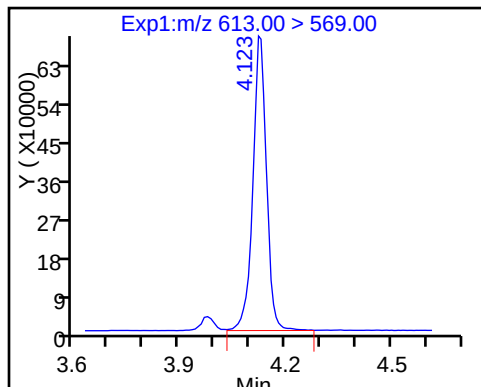
## D 36 13C2 PFDaA



## 37 Perfluorododecanoic acid

## D 38 d-N-EtFOSA-M

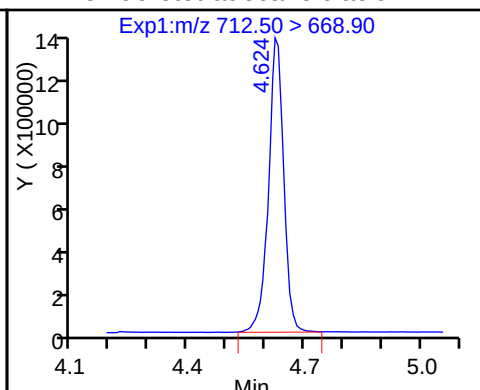
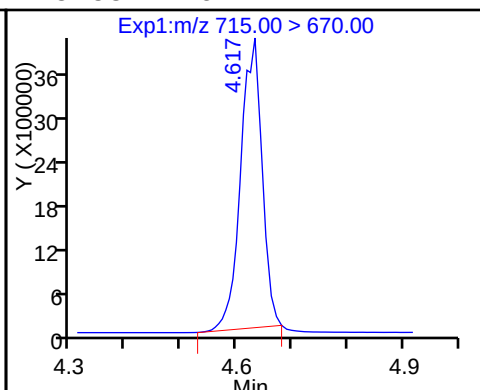
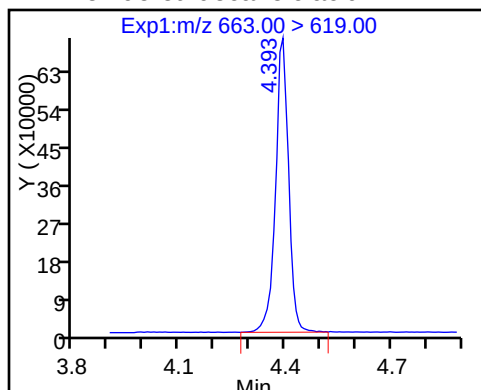
## 39 N-ethylperfluoro-1-octanesulfonami



## 41 Perfluorotridecanoic acid

## D 43 13C2-PFTeDA

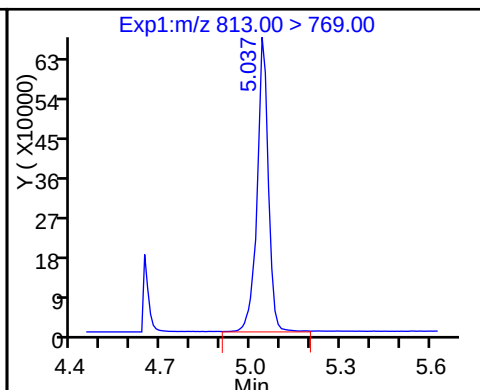
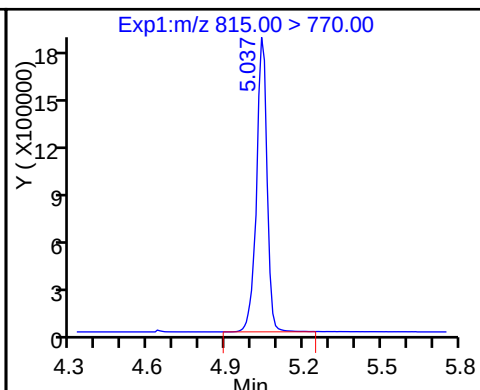
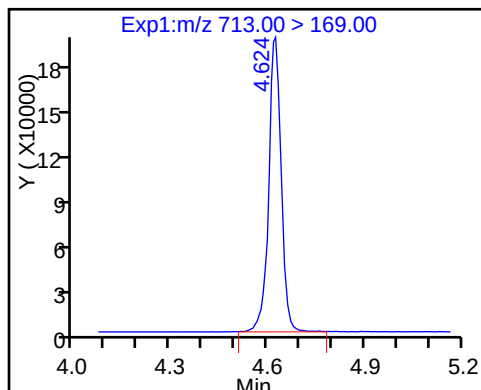
## 42 Perfluorotetradecanoic acid



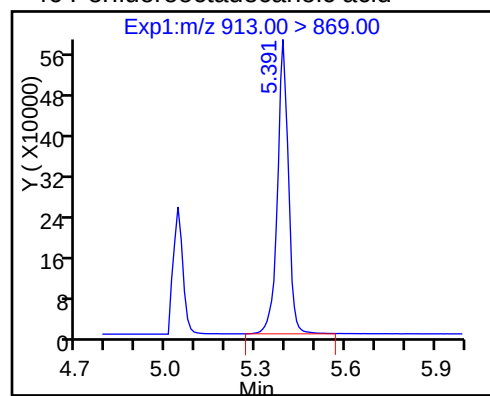
## 42 Perfluorotetradecanoic acid

## D 44 13C2-PFHxDA

## 45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

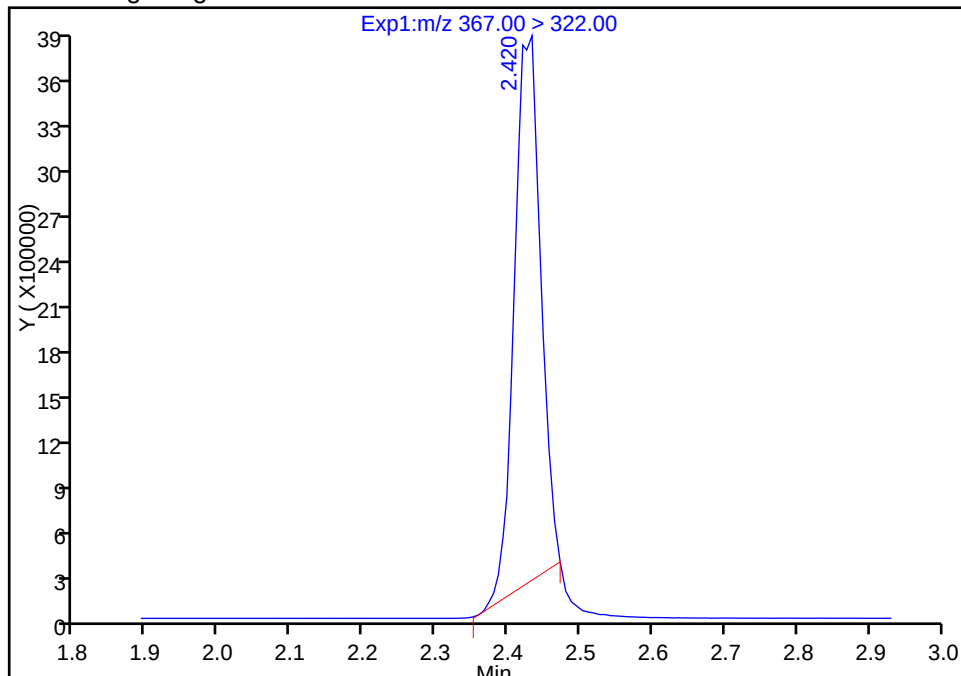
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d  
Injection Date: 15-Mar-2017 21:08:52 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**D 9 13C4-PFHpA, CAS: STL01892**

Signal: 1

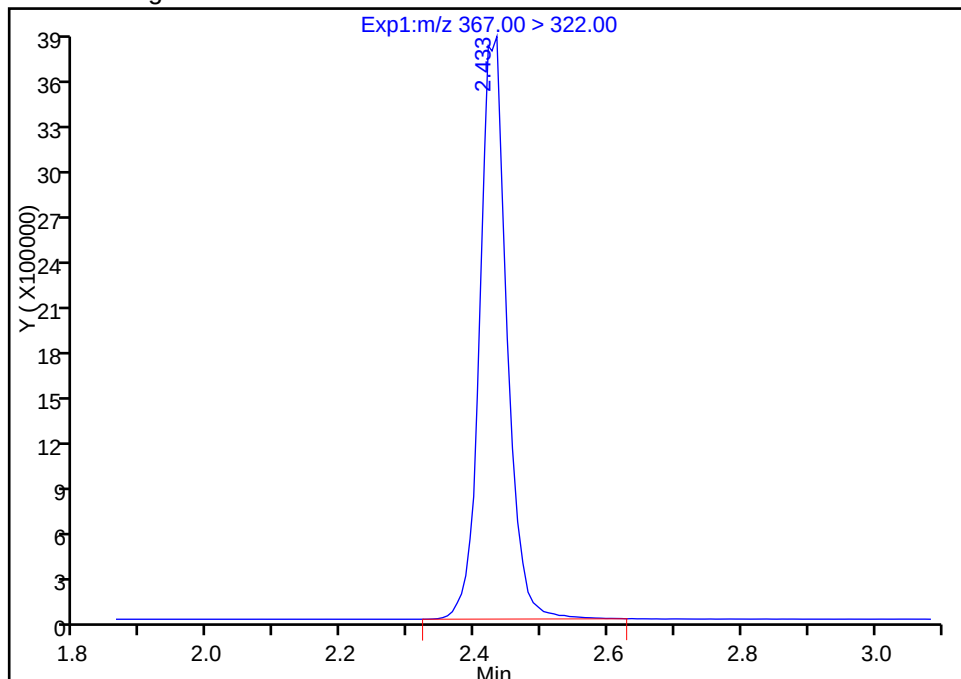
RT: 2.42  
Area: 9140021  
Amount: 47.367585  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.43  
Area: 10851641  
Amount: 56.237949  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 16-Mar-2017 11:49:47

Audit Action: Manually Integrated

Audit Reason: Incomplete Integration

## TestAmerica Sacramento

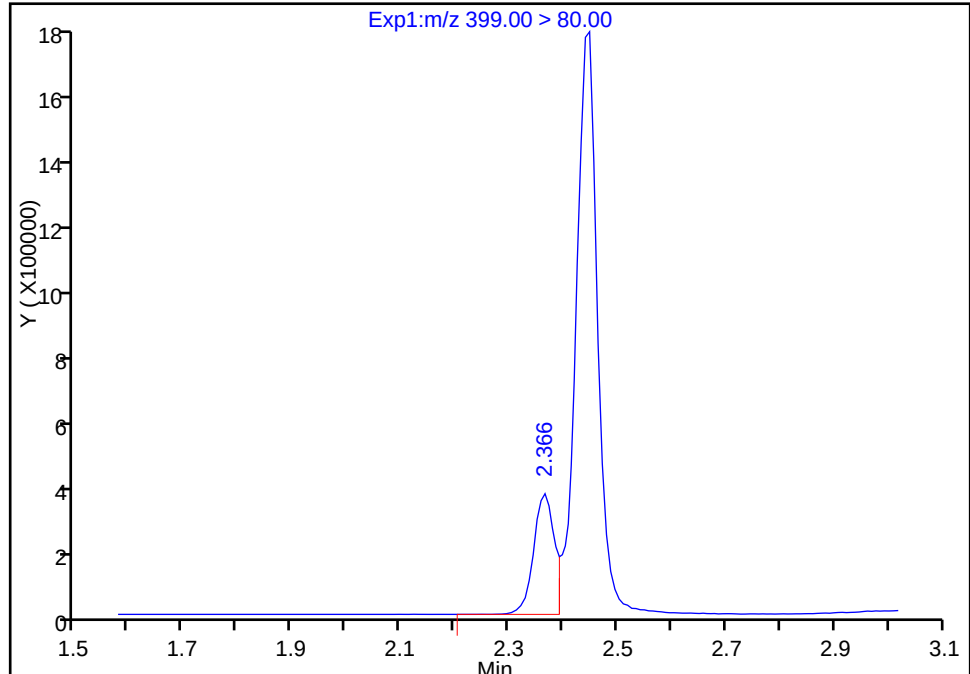
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d  
Injection Date: 15-Mar-2017 21:08:52 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**8 Perfluorohexanesulfonic acid, CAS: 355-46-4**

Signal: 1

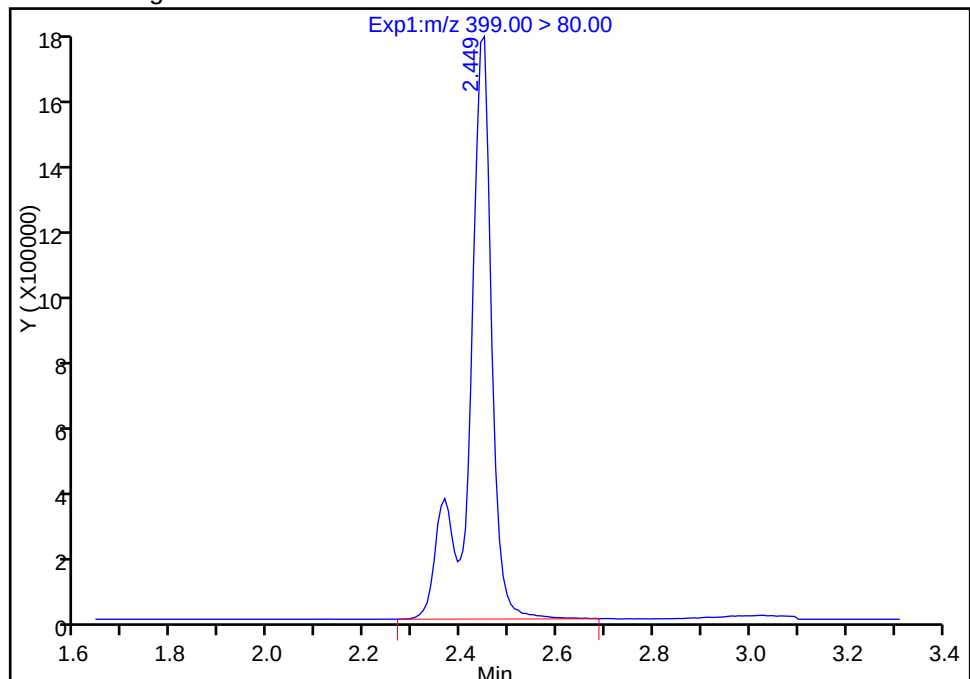
RT: 2.37  
Area: 941990  
Amount: 2.814391  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.45  
Area: 5757306  
Amount: 17.201148  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 16-Mar-2017 11:49:47

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

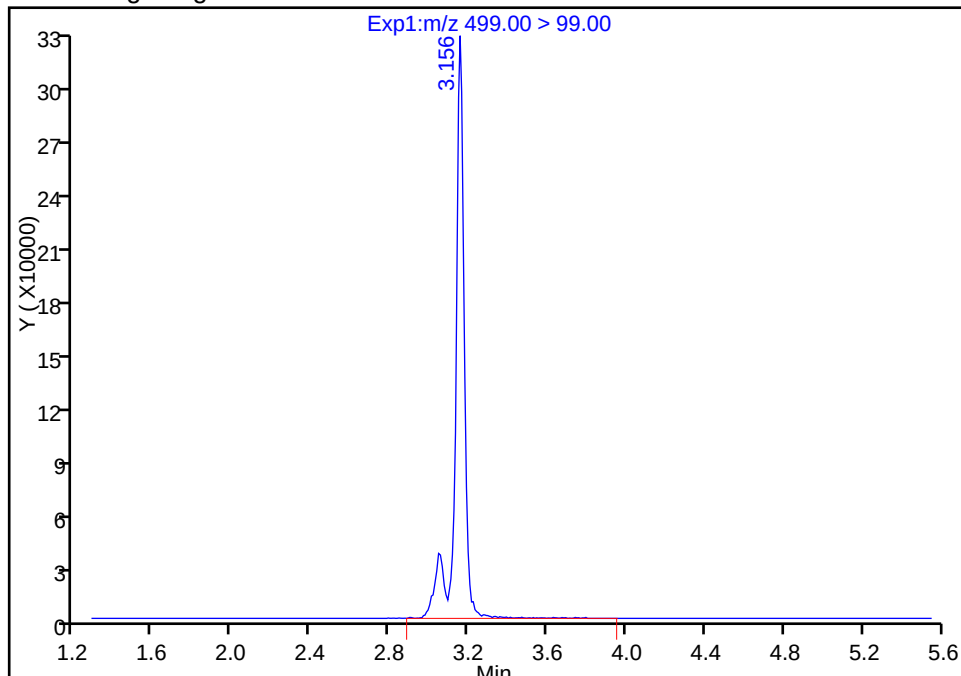
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d  
Injection Date: 15-Mar-2017 21:08:52 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 31 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

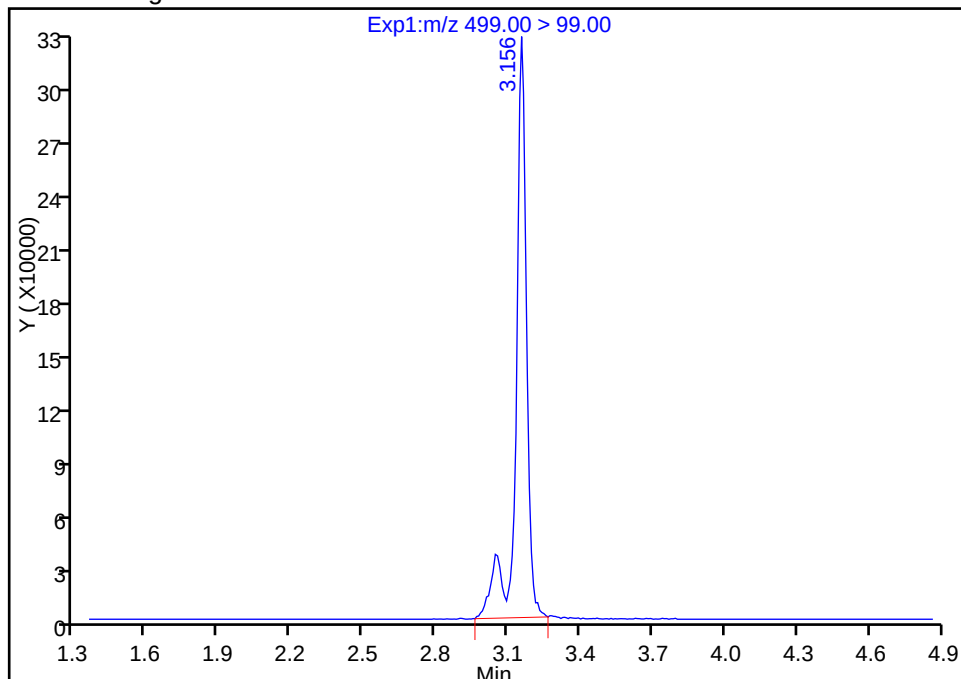
RT: 3.16  
Area: 1020610  
Amount: 18.005193  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.16  
Area: 990463  
Amount: 17.983692  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 16-Mar-2017 11:49:47

Audit Action: Manually Integrated

Audit Reason: Isomers



## TestAmerica Sacramento

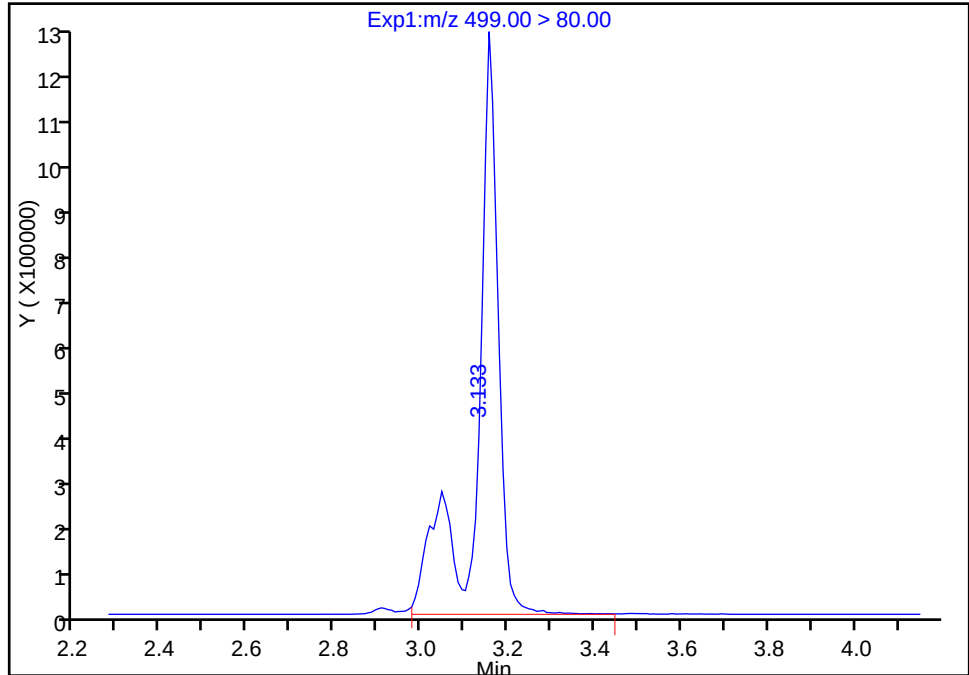
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b\2017.03.15D\_032.d  
Injection Date: 15-Mar-2017 21:08:52 Instrument ID: A8\_N  
Lims ID: CCV L4  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 31 Worklist Smp#: 9  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

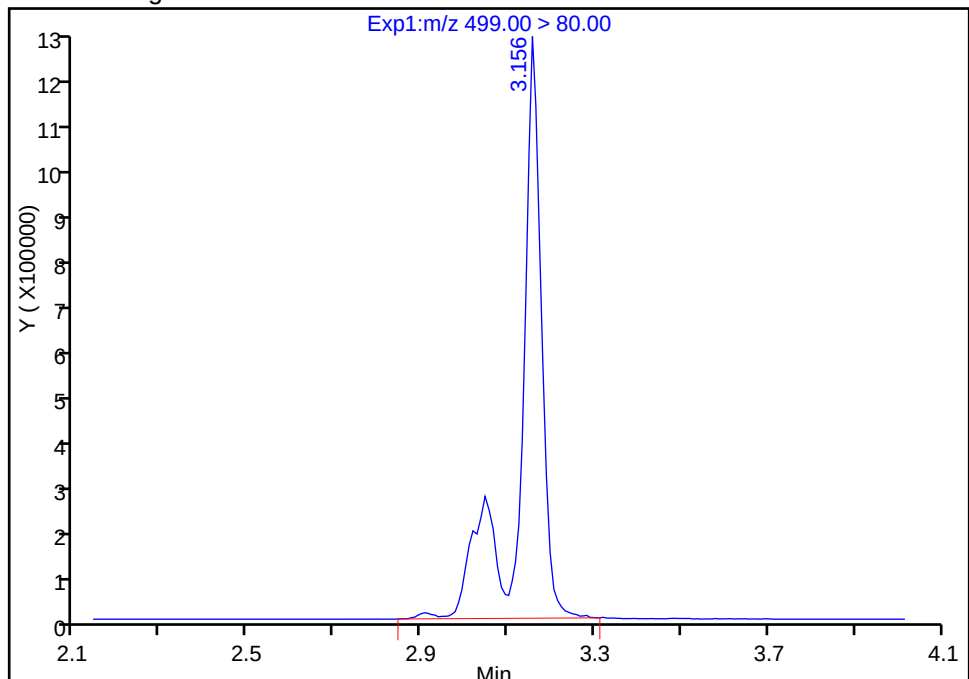
RT: 3.13  
Area: 4375497  
Amount: 18.005193  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.16  
Area: 4370272  
Amount: 17.983692  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: chandrasenas, 16-Mar-2017 11:49:47

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-154076/1-A  
 Matrix: Water Lab File ID: 2017.03.11D\_064.d  
 Analysis Method: 537 (Modified) Date Collected: \_\_\_\_\_  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 250 (mL) Date Analyzed: 03/12/2017 03:28  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q   | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|-----|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 2.0    | U M | 2.5 | 2.0 | 0.75 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 3.0    | U   | 4.0 | 3.0 | 1.3  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 2.0    | U   | 2.5 | 2.0 | 0.92 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 105  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 88   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 95   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_064.d  
 Lims ID: MB 320-154076/1-A  
 Client ID:  
 Sample Type: MB  
 Inject. Date: 12-Mar-2017 03:28:05 ALS Bottle#: 1 Worklist Smp#: 2  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: mb 320-154076/1-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:00:55 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:00:55

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                       | 1.547 | 1.538  | 0.009  |        | 13963239 | 47.8         |                 | 97.6 | 659839 |       |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        | M     |
| 212.90 > 169.00                       | 1.554 | 1.538  | 0.016  | 1.000  | 57274    | 0.2370       |                 |      | 282    | M     |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                       | 1.822 | 1.822  | 0.0    |        | 11134526 | 48.0         |                 | 98.0 | 602750 |       |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                       | 1.822 | 1.822  | 0.0    | 1.000  | 22981    | 0.1032       |                 |      | 183    |       |
| D 47 13C3-PFBS                        |       |        |        |        |          |              |                 |      |        |       |
| 301.90 > 83.00                        | 1.862 | 1.851  | 0.011  |        | 338293   | NC           |                 |      |        |       |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                        | 1.862 | 1.861  | 0.001  | 1.000  | 11196    | 0.0283       |                 |      |        |       |
| 298.90 > 99.00                        | 1.852 | 1.861  | -0.009 | 0.995  | 4298     |              | 2.60(0.00-0.00) |      |        |       |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                       | 2.124 | 2.116  | 0.008  |        | 9871327  | 46.8         |                 | 95.6 | 331956 |       |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        | M     |
| 399.00 > 80.00                        | 2.483 | 2.463  | 0.020  | 1.000  | 48734    | 0.1719       |                 |      |        | M     |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                       | 2.459 | 2.447  | 0.012  |        | 9880584  | 51.2         |                 | 105  | 278215 |       |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                        | 2.483 | 2.463  | 0.020  |        | 12768842 | 43.9         |                 | 94.8 | 376170 |       |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 427.00 > 407.00                       | 2.764 | 2.781  | -0.017 | 1.000  | 506      | NR           |                 |      |        |       |
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        | M     |
| 413.00 > 369.00                       | 2.825 | 2.812  | 0.013  | 1.000  | 25262    | 0.1150       |                 |      | 219    | M     |
| 413.00 > 169.00                       | 2.825 | 2.812  | 0.013  | 1.000  | 13545    |              | 1.87(0.90-1.10) |      | 801    | M     |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.825 | 2.812  | 0.013  |        | 10523886 | 51.3         |                 | 105  | 417821 |       |

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.825 | 2.820  | 0.005  | 1.000  | 4922     | 0.0224       |                 |      |        |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.201 | 3.194  | 0.007  |        | 9993608  | 41.4         |                 | 88.4 | 288788 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.201 | 3.194  | 0.007  |        | 8295144  | 46.6         |                 | 95.3 | 232062 |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.531 | 3.520  | 0.011  |        | 7669556  | 20.9         |                 | 42.7 | 208555 |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.523 | 3.528  | -0.005 | 1.000  | 14144    | 0.1005       |                 |      | 645    |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.506 | 3.537  | -0.031 | 0.990  | 1255     | NR           |                 |      |        |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.539 | 3.537  | 0.002  |        | 2723     | 0.0294       |                 | 0.0  |        |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.539 | 3.545  | -0.006 | 1.000  | 7769     | 0.0520       |                 |      | 232    |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.556 | 3.554  | 0.002  |        | 8074533  | 48.4         |                 | 98.9 | 161052 |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.717 | 3.693  | 0.024  |        | 13344    | 0.1566       |                 | 0.0  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.707 | 3.704  | 0.003  | 0.997  | 11681    | NR           |                 |      |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.860 | 3.850  | 0.010  | 1.000  | 5679     | 0.0446       |                 |      |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.877 | 3.867  | 0.010  |        | 6204710  | 47.4         |                 | 96.9 | 262173 |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.869 | 3.867  | 0.002  |        | 26481    | 0.3254       |                 | 0.0  |        |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.869 | 3.876  | -0.007 | 1.000  | 17113    | 0.1332       |                 |      | 465    |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 4.121 | 3.876  | 0.245  | 1.065  | 388      | NR           |                 |      |        |       |
| 35 MeFOSA                             |       |        |        |        |          |              |                 |      |        |       |
| 512.00 > 169.00                       | 3.993 | 4.019  | -0.026 | 1.000  | 1564     | NR           |                 |      |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 4.011 | 4.019  | -0.008 |        | 718      | 0.008161     |                 | 0.0  |        |       |
| D 36 13C2 PFDaA                       |       |        |        |        |          |              |                 |      |        |       |
| 615.00 > 570.00                       | 4.171 | 4.166  | 0.005  |        | 5257414  | 42.4         |                 | 86.7 | 160296 |       |
| D 38 d-N-EtFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 531.00 > 169.00                       | 4.198 | 4.202  | -0.004 |        | 3344     | 0.0392       |                 | 0.0  |        |       |
| 39 N-ethylperfluoro-1-octanesulfonami |       |        |        |        |          |              |                 |      |        |       |
| 526.00 > 169.00                       | 4.212 | 4.210  | 0.002  | 1.000  | 1966     | NR           |                 |      |        |       |
| 42 Perfluorotetradecanoic acid        |       |        |        |        |          |              |                 |      |        |       |
| 712.50 > 668.90                       | 4.681 | 4.658  | 0.023  | 1.000  | 67791    | 0.3210       |                 |      | 510    |       |
| 713.00 > 169.00                       | 4.673 | 4.658  | 0.015  | 0.998  | 8255     |              | 8.21(0.00-0.00) |      | 3062   |       |
| D 43 13C2-PFTeDA                      |       |        |        |        |          |              |                 |      |        |       |
| 715.00 > 670.00                       | 4.664 | 4.658  | 0.006  |        | 13210116 | 51.0         |                 | 104  | 393197 |       |

| Signal | RT | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|
|--------|----|-----------|-----------|-----------|----------|-----------------|---------------|------|-----|-------|

D 44 13C2-PFHxDA

815.00 &gt; 770.00 5.081 5.072 0.009 5601306 44.8 91.5 132106

### QC Flag Legend

#### Processing Flags

NR - Missing Quant Standard

NC - Not Calibrated

#### Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_064.d

Injection Date: 12-Mar-2017 03:28:05

Instrument ID: A8\_N

Lims ID: MB 320-154076/1-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 1

Worklist Smp#: 2

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

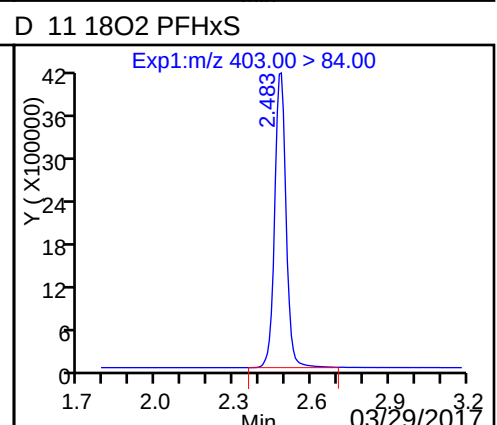
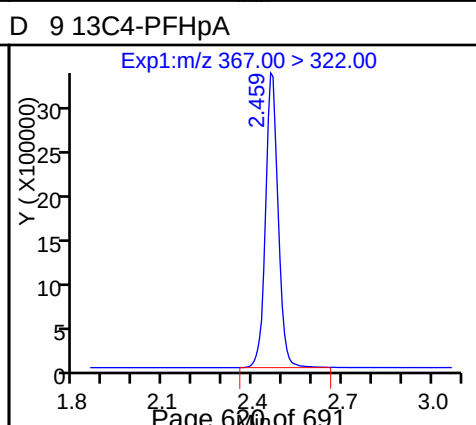
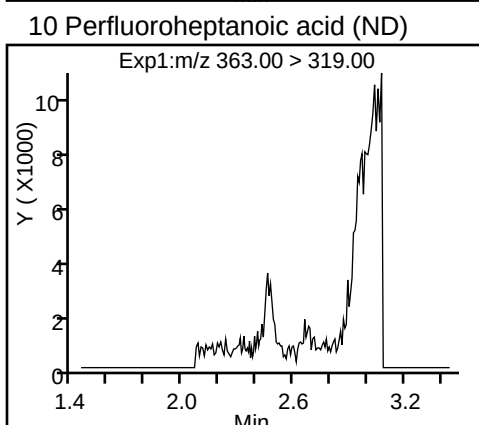
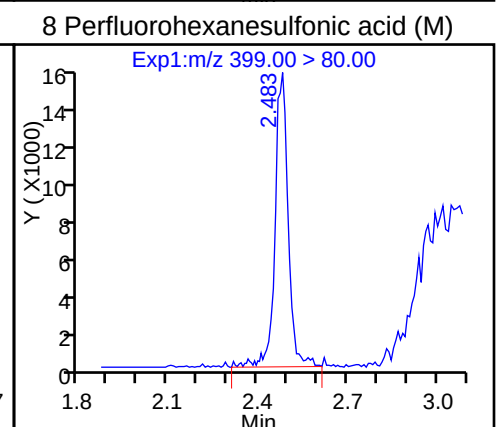
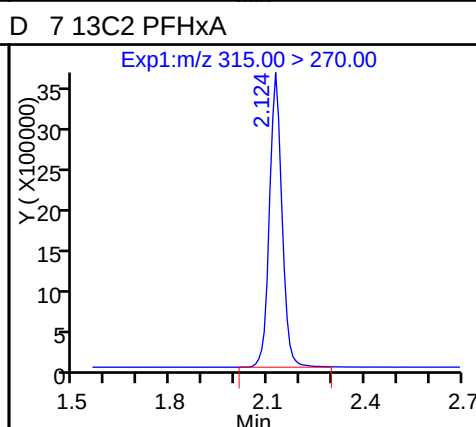
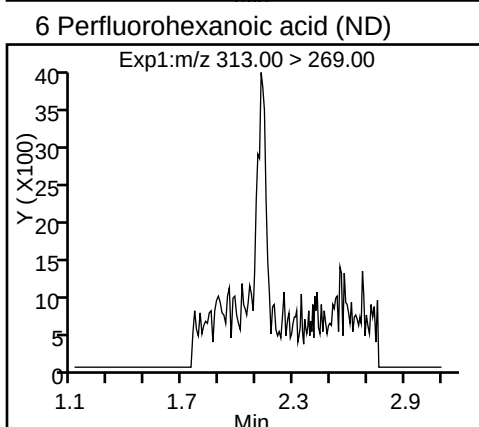
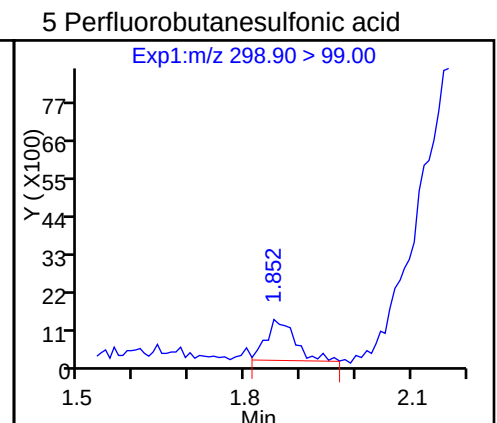
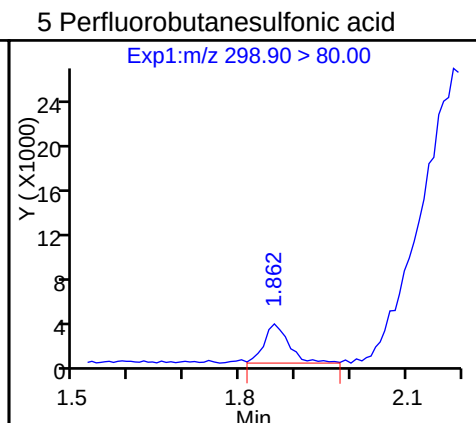
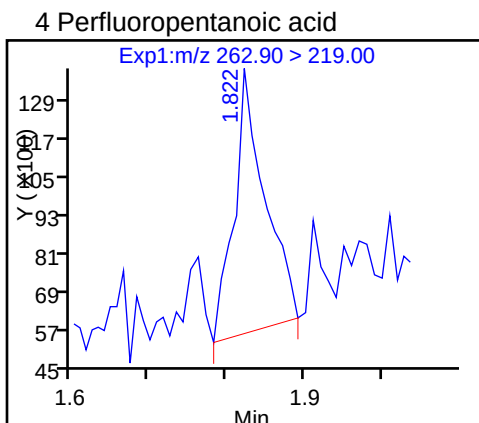
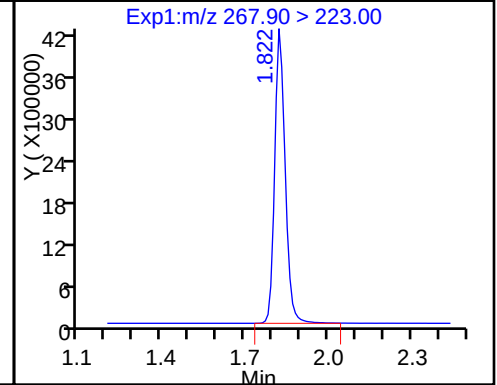
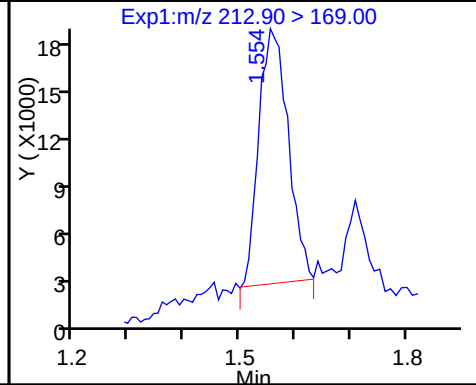
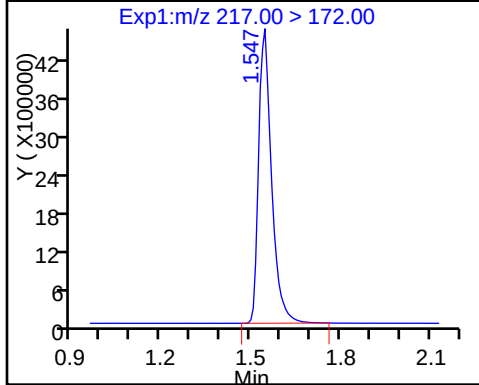
Method: A8\_N

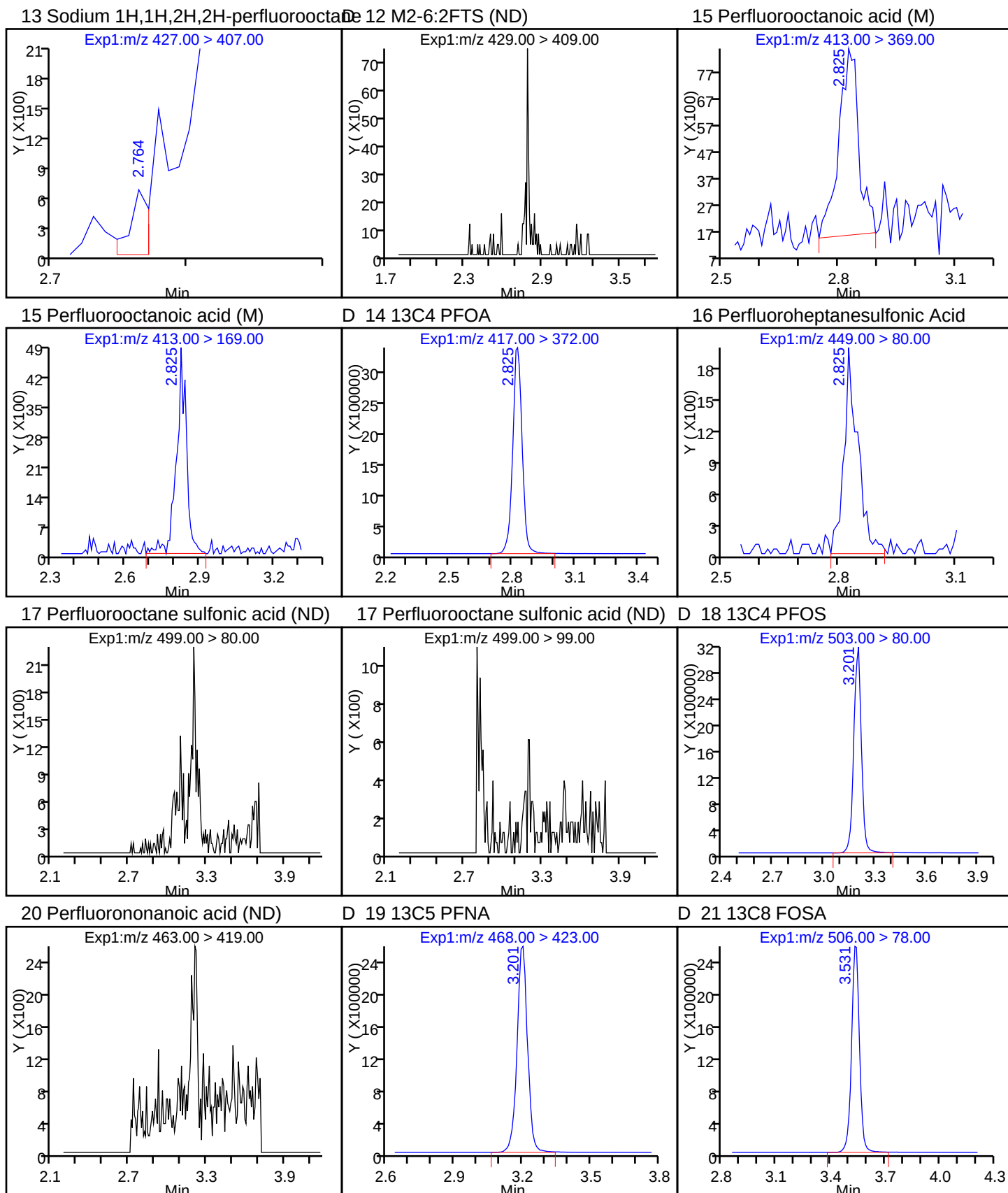
Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

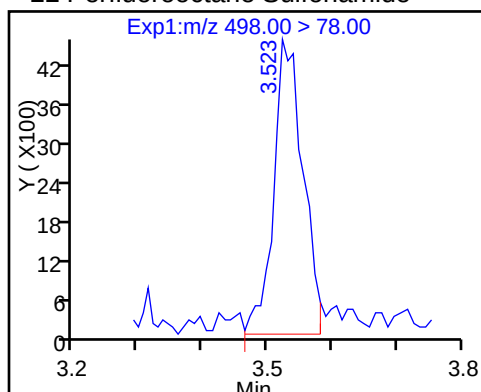
2 Perfluorobutyric acid (M)

D 3 13C5-PFPeA

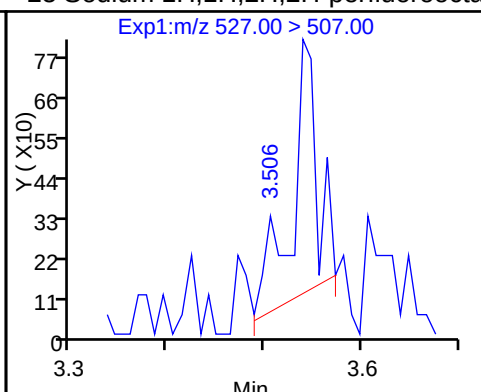




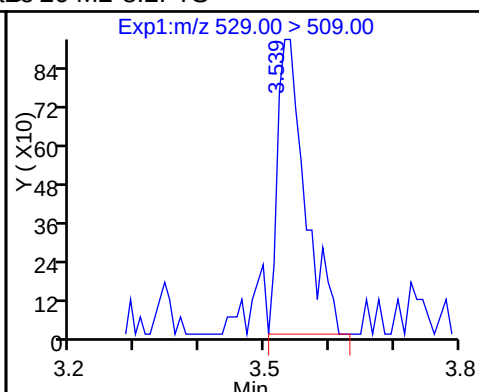
22 Perfluorooctane Sulfonamide



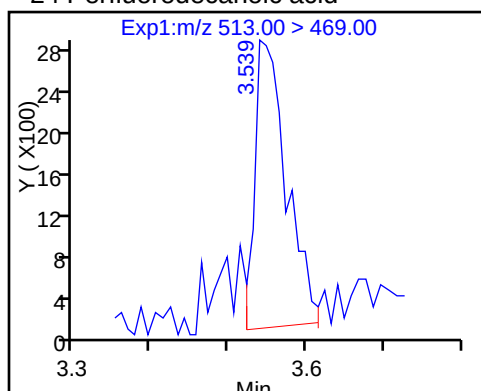
25 Sodium 1H,1H,2H,2H-perfluorooctane-1-sulfonate



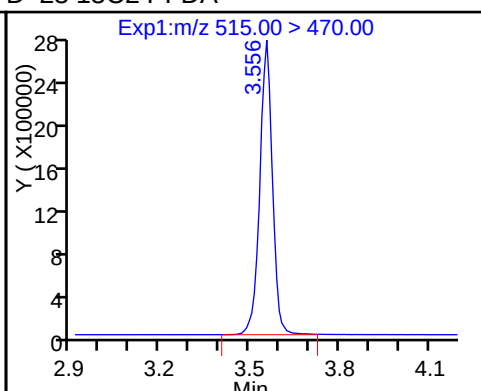
26 M2-8:2FTS



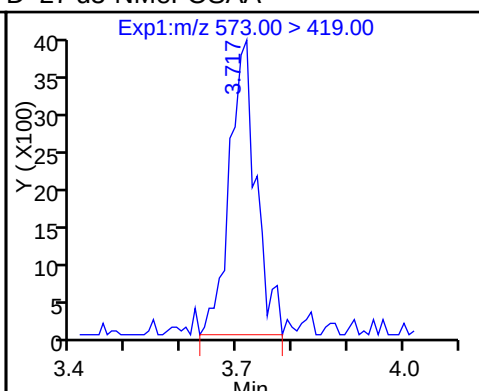
24 Perfluorodecanoic acid



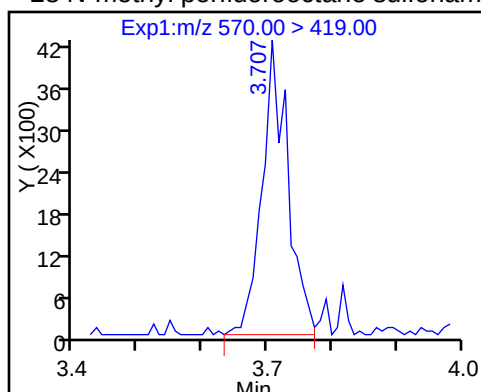
D 23 13C2 PFDA



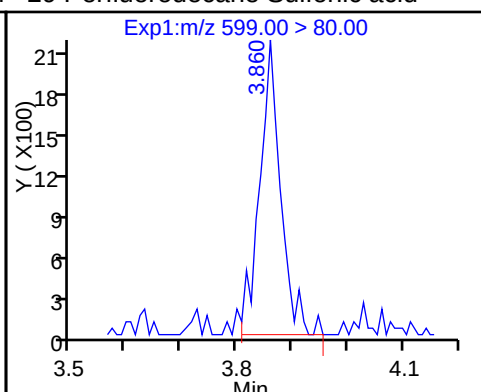
D 27 d3-NMeFOSAA



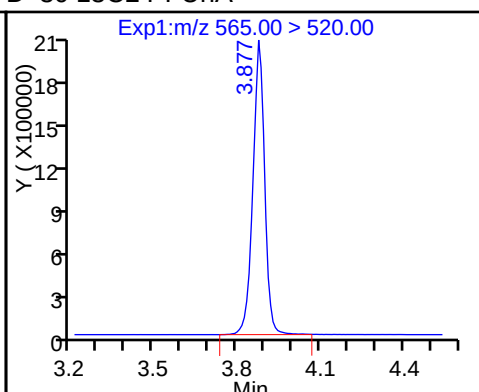
28 N-methyl perfluorooctane sulfonamide



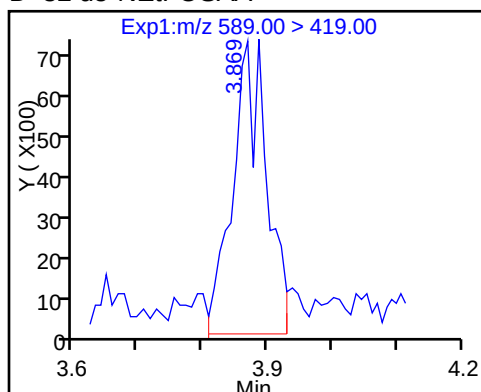
29 Perfluorodecane Sulfonic acid



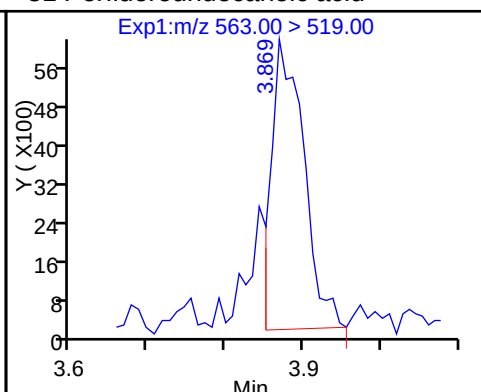
D 30 13C2 PFUnA



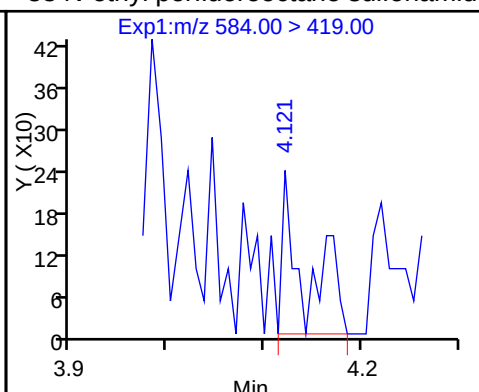
D 32 d5-NEtFOSAA



31 Perfluoroundecanoic acid

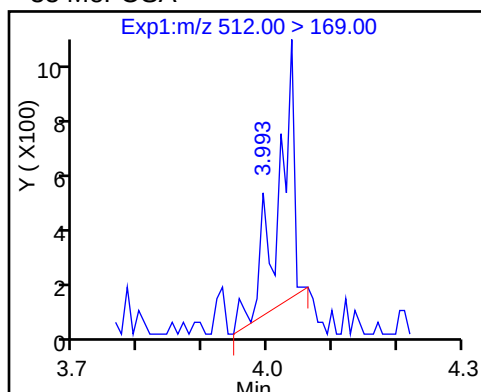


33 N-ethyl perfluorooctane sulfonamide

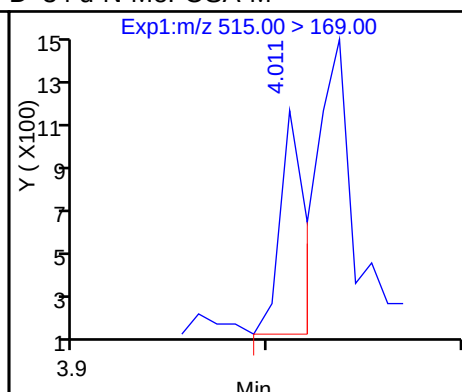




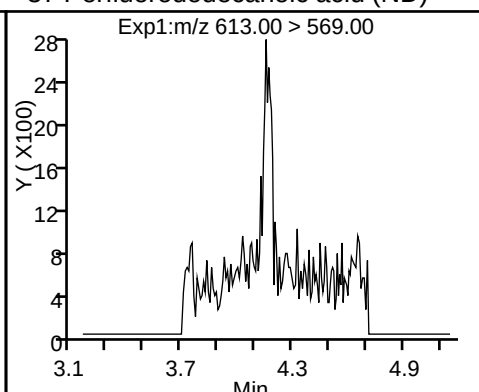
35 MeFOSA



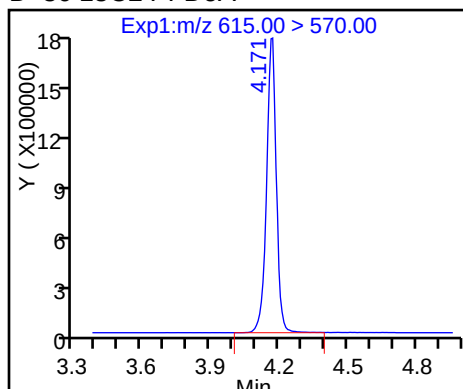
D 34 d-N-MeFOSA-M



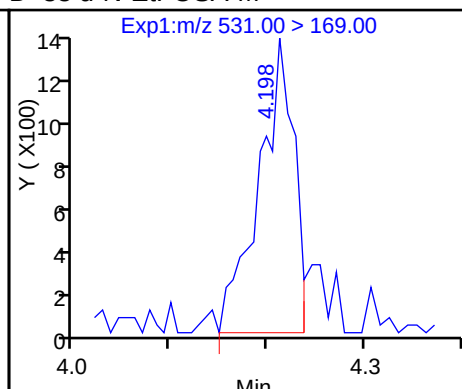
37 Perfluorododecanoic acid (ND)



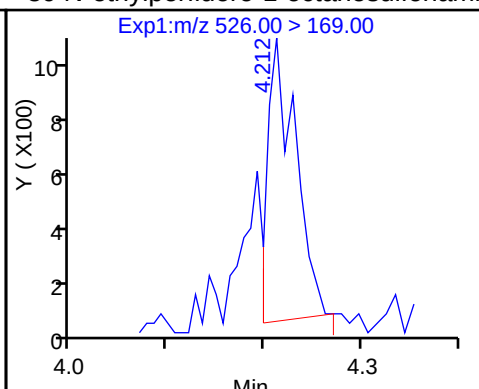
D 36 13C2 PFDaA



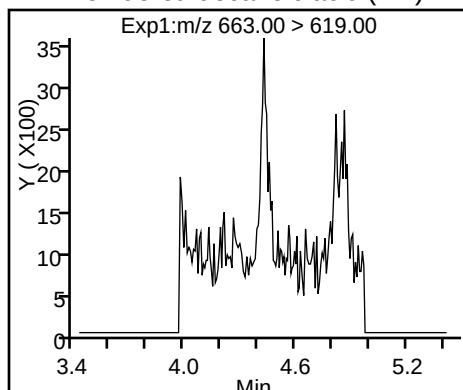
D 38 d-N-EtFOSA-M



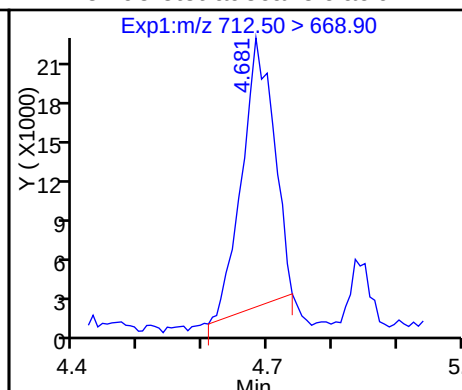
39 N-ethylperfluoro-1-octanesulfonami



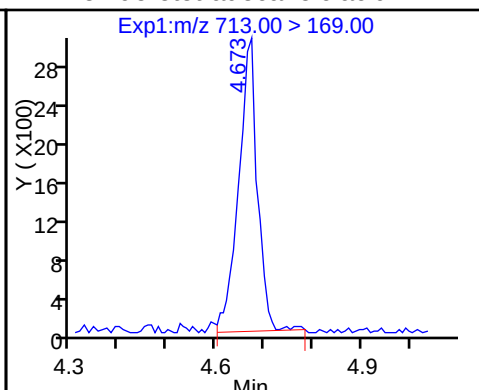
41 Perfluorotridecanoic acid (ND)



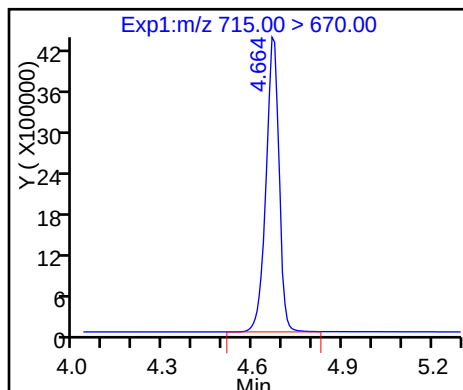
42 Perfluorotetradecanoic acid



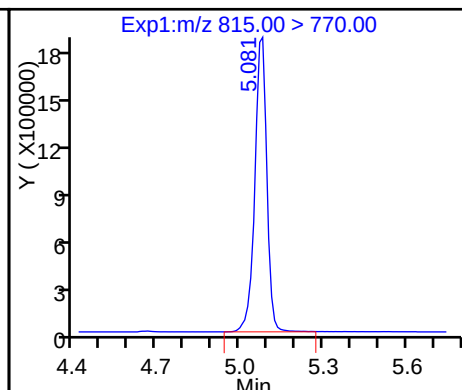
42 Perfluorotetradecanoic acid



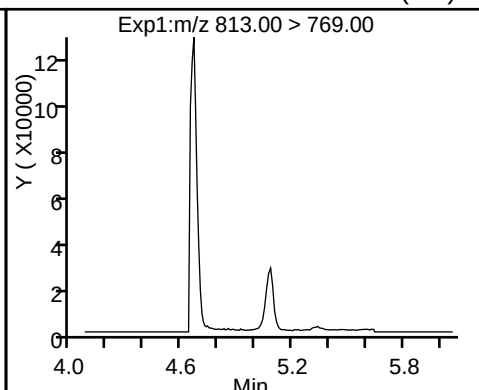
D 43 13C2-PFTeDA



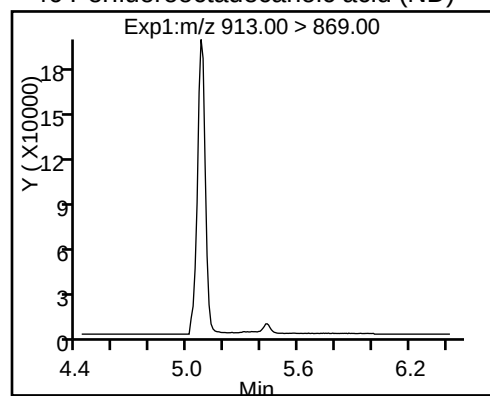
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid (ND)



46 Perfluorooctadecanoic acid (ND)



## TestAmerica Sacramento

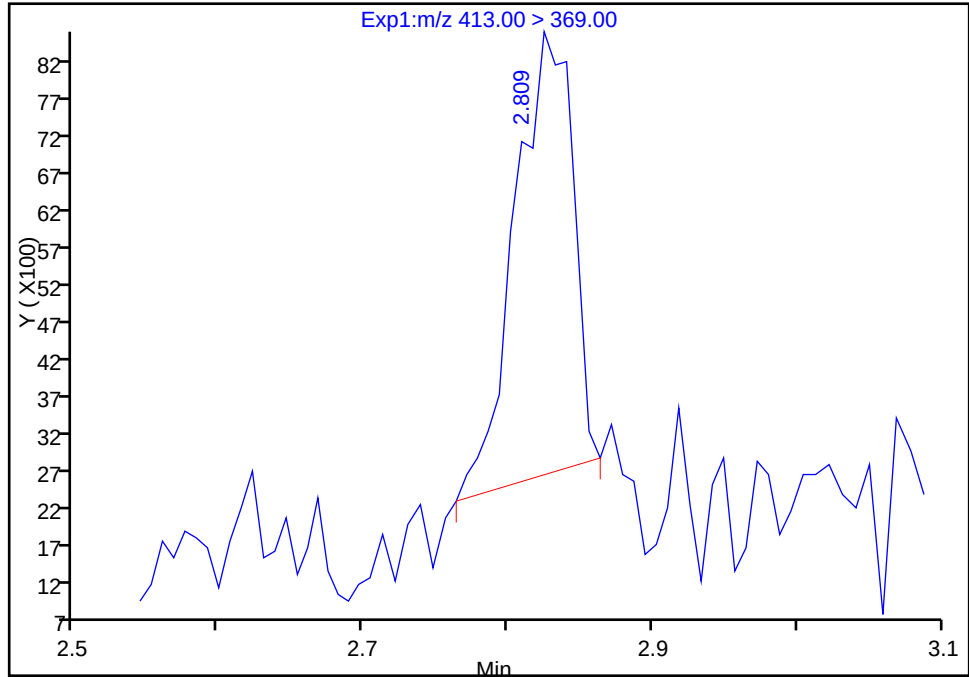
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_064.d  
Injection Date: 12-Mar-2017 03:28:05 Instrument ID: A8\_N  
Lims ID: MB 320-154076/1-A  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 1

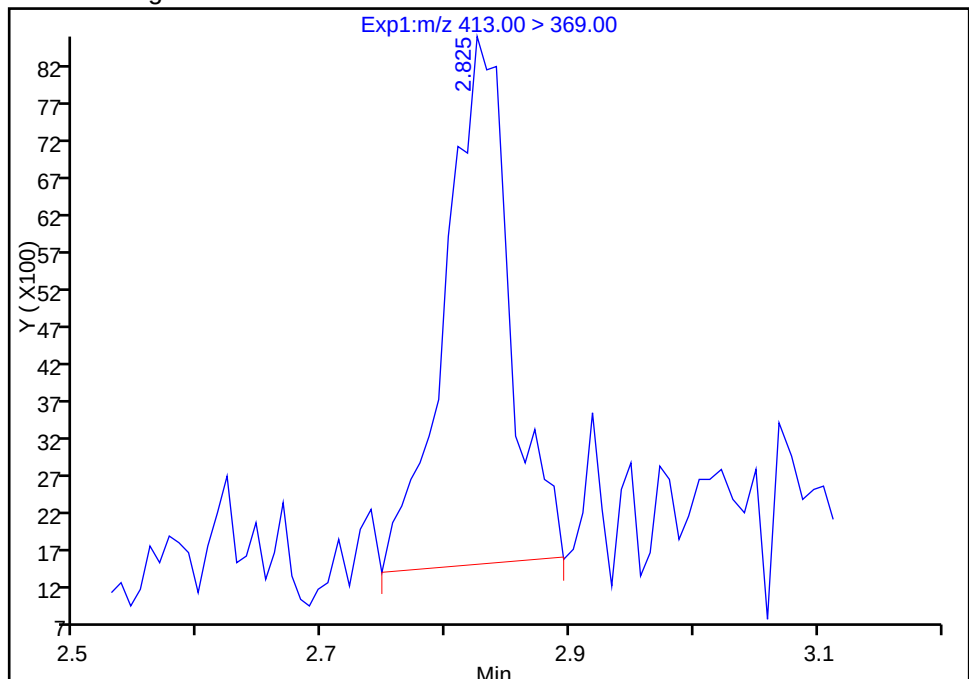
RT: 2.81  
Area: 16300  
Amount: 0.074211  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.82  
Area: 25262  
Amount: 0.115013  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:57:40

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

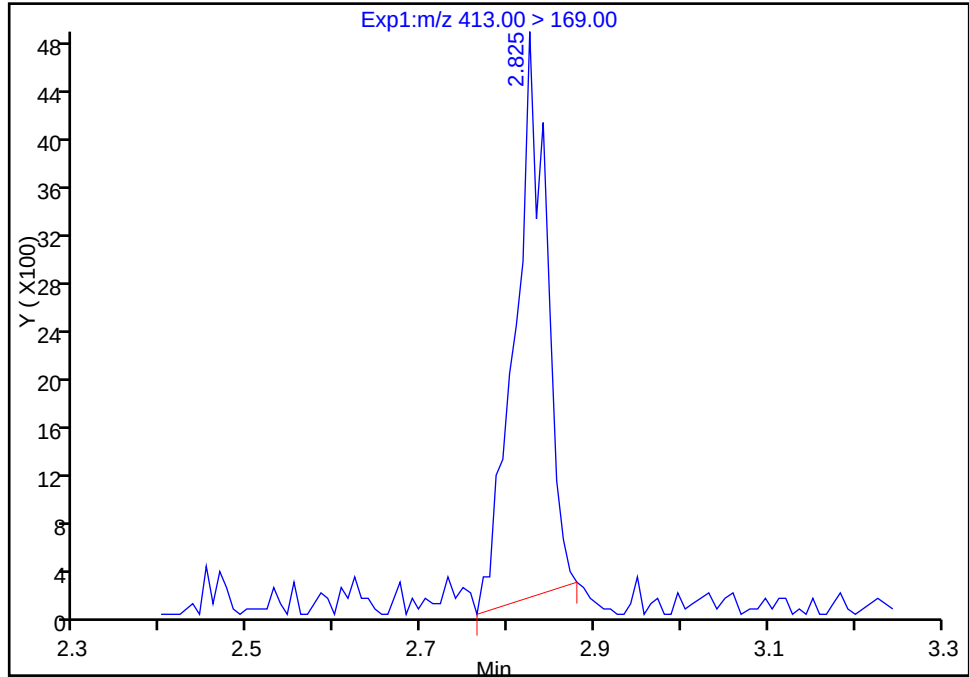
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_064.d  
Injection Date: 12-Mar-2017 03:28:05 Instrument ID: A8\_N  
Lims ID: MB 320-154076/1-A  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 1 Worklist Smp#: 2  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**15 Perfluorooctanoic acid, CAS: 335-67-1**

Signal: 2

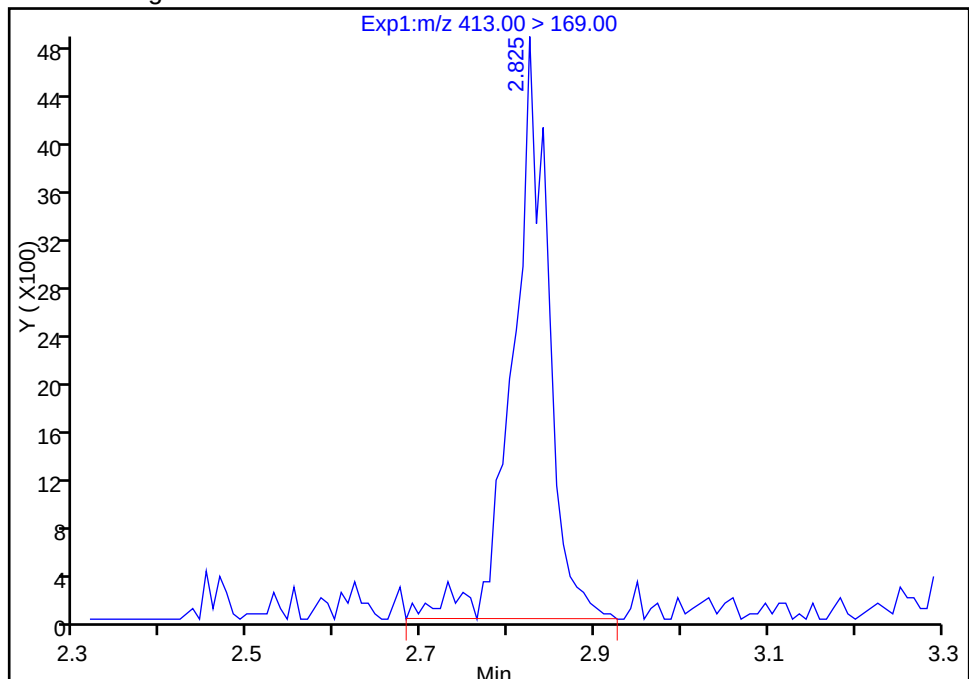
RT: 2.82  
Area: 11727  
Amount: 0.074211  
Amount Units: ng/ml

## Processing Integration Results



RT: 2.82  
Area: 13545  
Amount: 0.115013  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 10:58:13

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: LCS 320-154076/2-A  
 Matrix: Water Lab File ID: 2017.03.11D\_065.d  
 Analysis Method: 537 (Modified) Date Collected: \_\_\_\_\_  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 250 (mL) Date Analyzed: 03/12/2017 03:35  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 45.1   |   | 2.5 | 2.0 | 0.75 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 42.1   | M | 4.0 | 3.0 | 1.3  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 44.5   |   | 2.5 | 2.0 | 0.92 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 100  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 91   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 95   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_065.d  
 Lims ID: LCS 320-154076/2-A  
 Client ID:  
 Sample Type: LCS  
 Inject. Date: 12-Mar-2017 03:35:35 ALS Bottle#: 2 Worklist Smp#: 3  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: lcs 320-154076/2-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:04:32 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:04:32

| Signal                         | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|--------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 1 13C4 PFBA                  |       |        |        |        |          |              |                 |      |        |       |
| 217.00 > 172.00                | 1.539 | 1.538  | 0.001  |        | 13972903 | 47.8         |                 | 97.7 | 768691 |       |
| 2 Perfluorobutyric acid        |       |        |        |        |          |              |                 |      |        |       |
| 212.90 > 169.00                | 1.539 | 1.538  | 0.001  | 1.000  | 5822033  | 24.1         |                 | 120  | 41137  |       |
| D 3 13C5-PFPeA                 |       |        |        |        |          |              |                 |      |        |       |
| 267.90 > 223.00                | 1.823 | 1.822  | 0.001  |        | 11177954 | 48.1         |                 | 98.3 | 663345 |       |
| 4 Perfluoropentanoic acid      |       |        |        |        |          |              |                 |      |        |       |
| 262.90 > 219.00                | 1.813 | 1.822  | -0.009 | 1.000  | 5020976  | 22.5         |                 | 112  | 42525  |       |
| D 47 13C3-PFBS                 |       |        |        |        |          |              |                 |      |        |       |
| 301.90 > 83.00                 | 1.853 | 1.851  | 0.002  |        | 331933   | NC           |                 |      |        |       |
| 5 Perfluorobutanesulfonic acid |       |        |        |        |          |              |                 |      |        |       |
| 298.90 > 80.00                 | 1.863 | 1.861  | 0.002  | 1.000  | 8797681  | 22.2         |                 | 126  |        |       |
| 298.90 > 99.00                 | 1.853 | 1.861  | -0.008 | 0.995  | 3533402  |              | 2.49(0.00-0.00) |      |        |       |
| 6 Perfluorohexanoic acid       |       |        |        |        |          |              |                 |      |        |       |
| 313.00 > 269.00                | 2.117 | 2.108  | 0.009  | 1.000  | 3991421  | 22.4         |                 | 112  | 91595  |       |
| D 7 13C2 PFHxA                 |       |        |        |        |          |              |                 |      |        |       |
| 315.00 > 270.00                | 2.117 | 2.116  | 0.001  |        | 9787405  | 46.4         |                 | 94.8 | 356056 |       |
| 10 Perfluoroheptanoic acid     |       |        |        |        |          |              |                 |      |        |       |
| 363.00 > 319.00                | 2.455 | 2.447  | 0.008  | 1.000  | 4215762  | 22.1         |                 | 110  | 45520  |       |
| D 9 13C4-PFHpA                 |       |        |        |        |          |              |                 |      |        |       |
| 367.00 > 322.00                | 2.447 | 2.447  | 0.0    |        | 9671578  | 50.1         |                 | 102  | 327969 |       |
| 8 Perfluorohexanesulfonic acid |       |        |        |        |          |              |                 |      |        | M     |
| 399.00 > 80.00                 | 2.471 | 2.463  | 0.008  | 1.000  | 5745933  | 20.2         |                 | 111  |        | M     |
| D 11 18O2 PFHxS                |       |        |        |        |          |              |                 |      |        |       |
| 403.00 > 84.00                 | 2.471 | 2.463  | 0.008  |        | 12785598 | 44.0         |                 | 94.9 | 259613 |       |
| 15 Perfluorooctanoic acid      |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                | 2.814 | 2.812  | 0.002  | 1.000  | 4734449  | 22.5         |                 | 113  | 43659  |       |
| 413.00 > 169.00                | 2.814 | 2.812  | 0.002  | 1.000  | 2848385  |              | 1.66(0.90-1.10) |      | 72253  |       |

| Signal                           | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|----------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| D 14 13C4 PFOA                   |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                  | 2.814 | 2.812  | 0.002  |        | 10062863 | 49.1         |                 | 100  | 363904 |       |
| 16 Perfluoroheptanesulfonic Acid |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                   | 2.822 | 2.820  | 0.002  | 1.000  | 5378839  | 23.8         |                 | 125  |        |       |
| 17 Perfluorooctane sulfonic acid |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                   | 3.196 | 3.186  | 0.010  | 1.000  | 4531434  | 21.0         |                 | 113  | 208974 | M     |
| 499.00 > 99.00                   | 3.196 | 3.186  | 0.010  | 1.000  | 1031497  |              | 4.39(0.90-1.10) |      | 43639  | M     |
| 20 Perfluorononanoic acid        |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                  | 3.196 | 3.186  | 0.010  | 1.000  | 3505981  | 23.8         |                 | 119  | 65573  |       |
| D 18 13C4 PFOS                   |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                   | 3.196 | 3.194  | 0.002  |        | 10247289 | 42.4         |                 | 90.6 | 264392 |       |
| D 19 13C5 PFNA                   |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                  | 3.196 | 3.194  | 0.002  |        | 7986406  | 44.9         |                 | 91.7 | 271457 |       |
| D 21 13C8 FOSA                   |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                   | 3.536 | 3.520  | 0.016  |        | 6137205  | 16.7         |                 | 34.2 | 148679 |       |
| 22 Perfluorooctane Sulfonamide   |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                   | 3.536 | 3.528  | 0.008  | 1.000  | 2459246  | 21.8         |                 | 109  | 82095  |       |
| 24 Perfluorodecanoic acid        |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                  | 3.553 | 3.545  | 0.008  | 1.000  | 3495414  | 24.2         |                 | 121  | 115628 |       |
| D 23 13C2 PFDA                   |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                  | 3.561 | 3.554  | 0.007  |        | 7801413  | 46.8         |                 | 95.6 | 158650 |       |
| 29 Perfluorodecane Sulfonic acid |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                   | 3.857 | 3.850  | 0.007  | 1.000  | 2812278  | 21.6         |                 | 112  |        |       |
| D 30 13C2 PFUnA                  |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                  | 3.874 | 3.867  | 0.007  |        | 6235495  | 47.7         |                 | 97.4 | 292528 |       |
| 31 Perfluoroundecanoic acid      |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                  | 3.874 | 3.876  | -0.002 | 1.000  | 2415301  | 18.7         |                 | 93.5 | 62539  |       |
| 37 Perfluorododecanoic acid      |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                  | 4.177 | 4.159  | 0.018  | 1.000  | 2123080  | 22.4         |                 | 112  | 49320  |       |
| D 36 13C2 PFDaA                  |       |        |        |        |          |              |                 |      |        |       |
| 615.00 > 570.00                  | 4.169 | 4.166  | 0.003  |        | 5078333  | 41.0         |                 | 83.7 | 154098 |       |
| 41 Perfluorotridecanoic acid     |       |        |        |        |          |              |                 |      |        |       |
| 663.00 > 619.00                  | 4.433 | 4.421  | 0.012  | 1.000  | 2241258  | 24.7         |                 | 124  | 46710  |       |
| 42 Perfluorotetradecanoic acid   |       |        |        |        |          |              |                 |      |        |       |
| 712.50 > 668.90                  | 4.670 | 4.658  | 0.012  | 1.000  | 5046932  | 24.7         |                 | 124  | 45612  |       |
| 713.00 > 169.00                  | 4.670 | 4.658  | 0.012  | 1.000  | 725628   |              | 6.96(0.00-0.00) |      | 122994 |       |
| D 43 13C2-PFTeDA                 |       |        |        |        |          |              |                 |      |        |       |
| 715.00 > 670.00                  | 4.670 | 4.658  | 0.012  |        | 12424550 | 47.9         |                 | 97.9 | 291462 |       |
| D 44 13C2-PFHxDA                 |       |        |        |        |          |              |                 |      |        |       |
| 815.00 > 770.00                  | 5.080 | 5.072  | 0.008  |        | 5184429  | 41.5         |                 | 84.7 | 111192 |       |
| 45 Perfluorohexadecanoic acid    |       |        |        |        |          |              |                 |      |        |       |
| 813.00 > 769.00                  | 5.080 | 5.072  | 0.008  | 1.000  | 2110444  | 21.6         |                 | 108  | 3905   |       |
| 46 Perfluorooctadecanoic acid    |       |        |        |        |          |              |                 |      |        |       |
| 913.00 > 869.00                  | 5.429 | 5.423  | 0.006  | 1.000  | 1808775  | 24.3         |                 | 121  | 2133   |       |

## QC Flag Legend

### Processing Flags

NC - Not Calibrated

### Review Flags

M - Manually Integrated



## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_065.d

Injection Date: 12-Mar-2017 03:35:35

Instrument ID: A8\_N

Lims ID: LCS 320-154076/2-A

Client ID:

Operator ID: A8-PC\A8

ALS Bottle#: 2

Worklist Smp#: 3

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

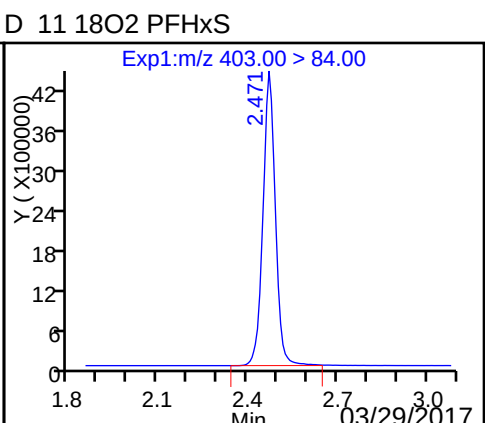
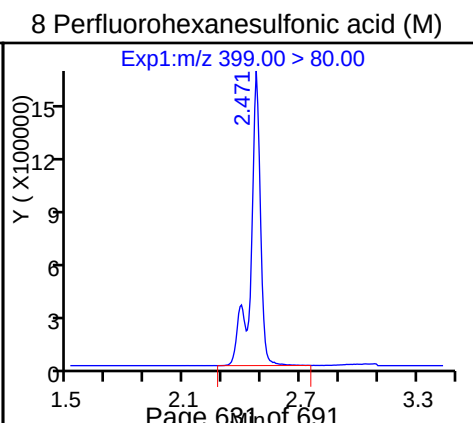
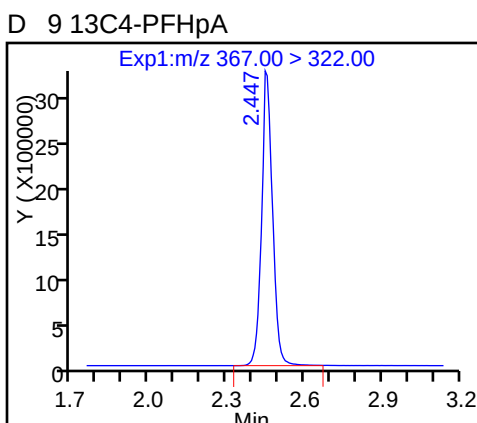
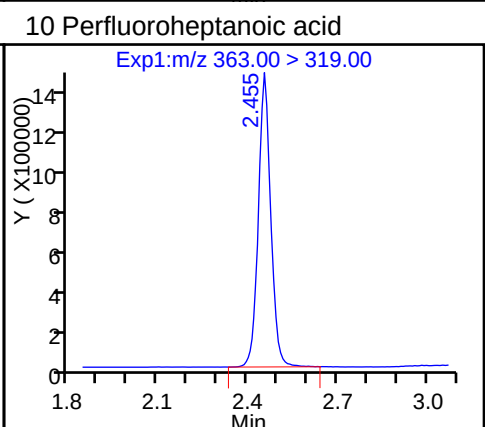
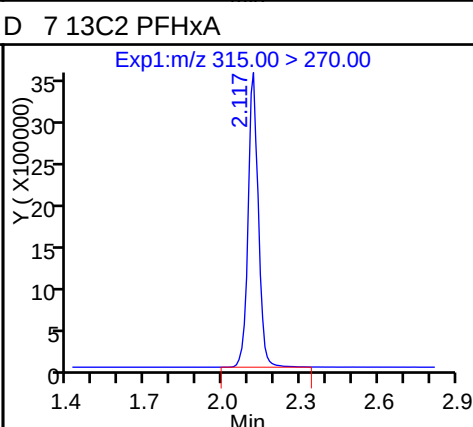
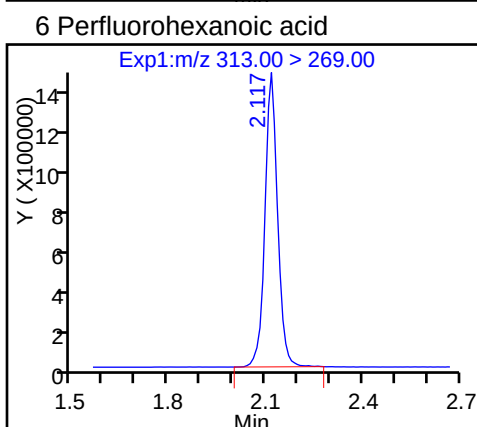
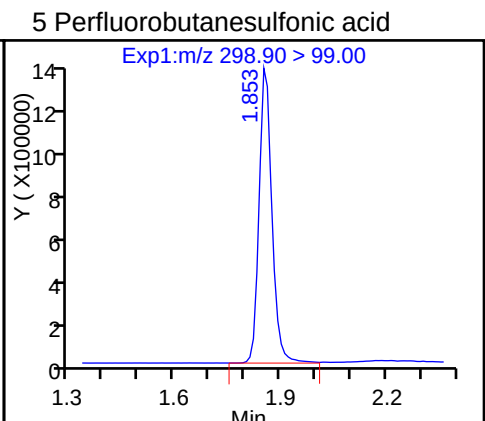
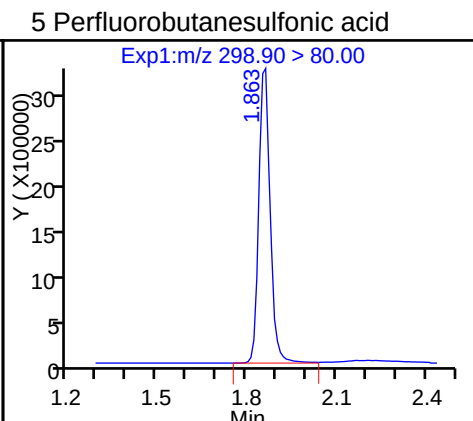
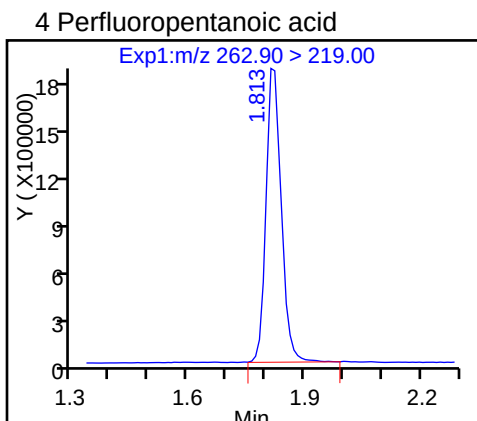
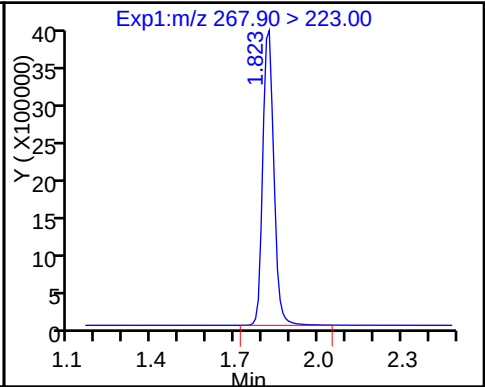
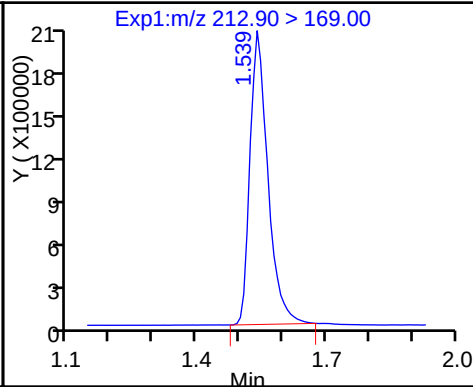
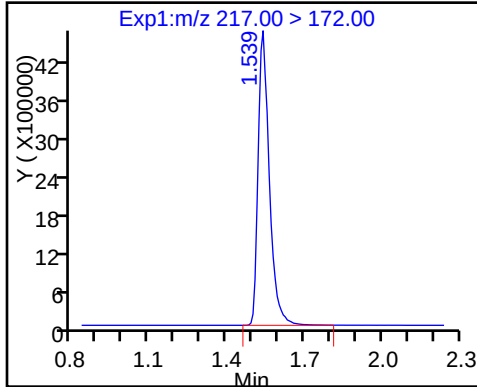
Method: A8\_N

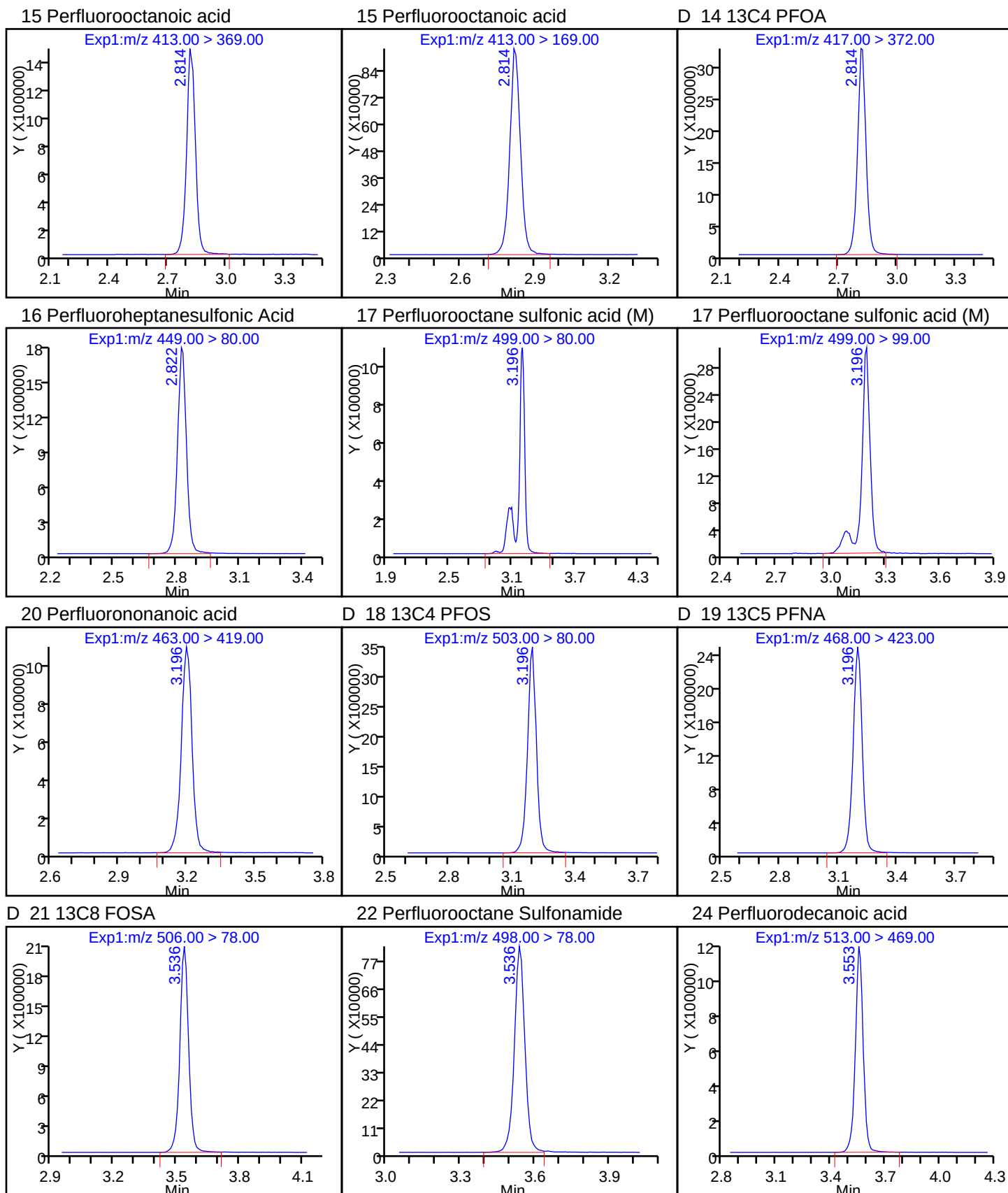
Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

D 3 13C5-PFPeA

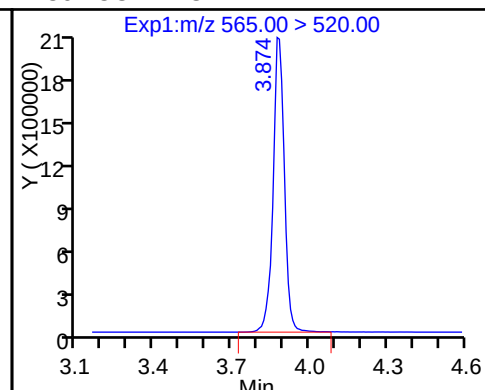
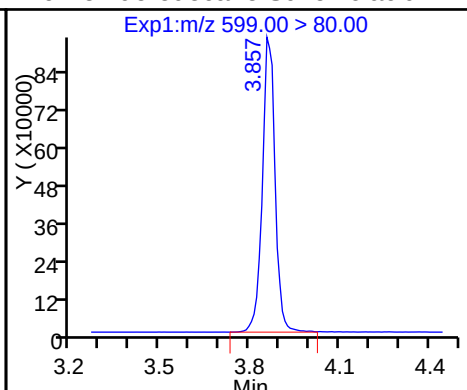
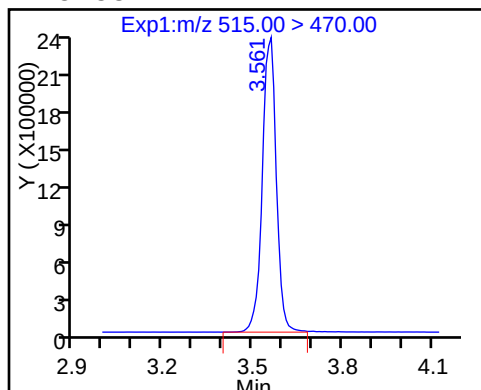




## D 23 13C2 PFDA

## 29 Perfluorodecane Sulfonic acid

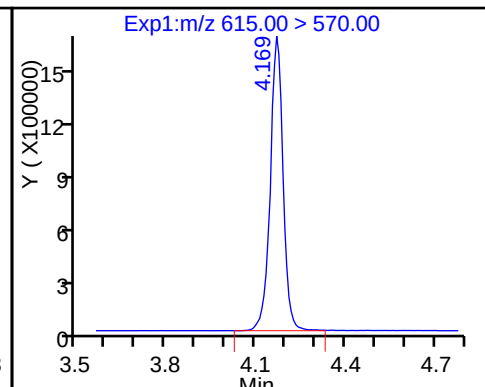
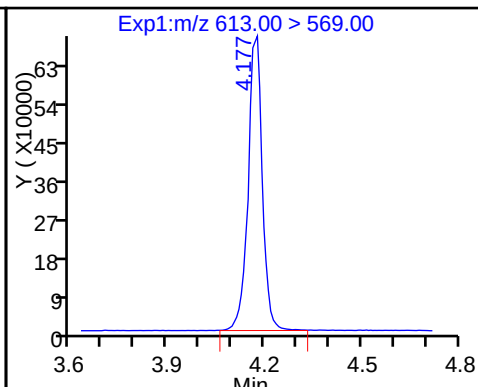
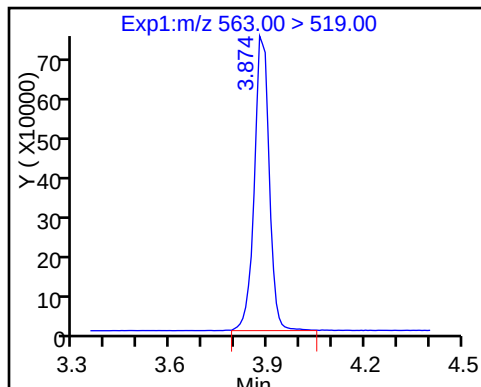
## D 30 13C2 PFUnA



## 31 Perfluoroundecanoic acid

## 37 Perfluorododecanoic acid

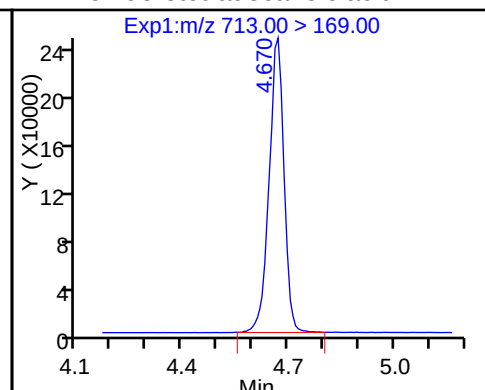
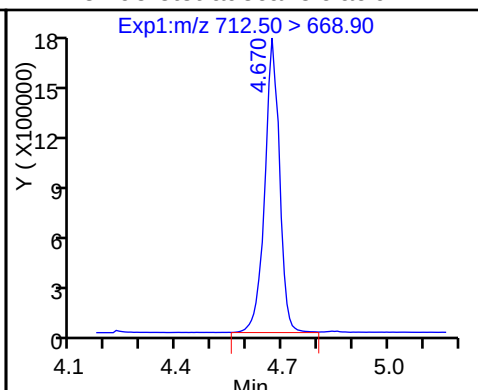
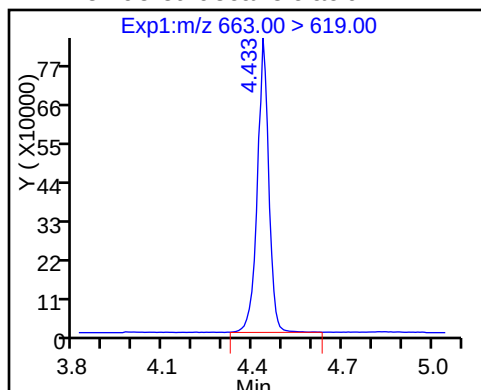
## D 36 13C2 PFDa



## 41 Perfluorotridecanoic acid

## 42 Perfluorotetradecanoic acid

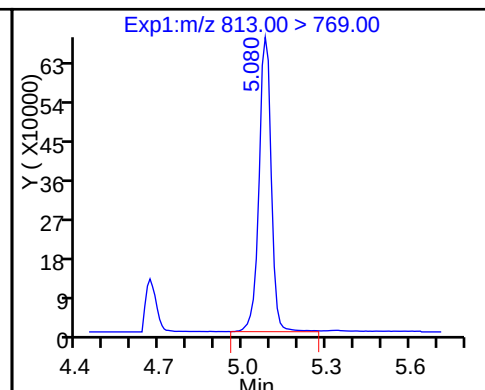
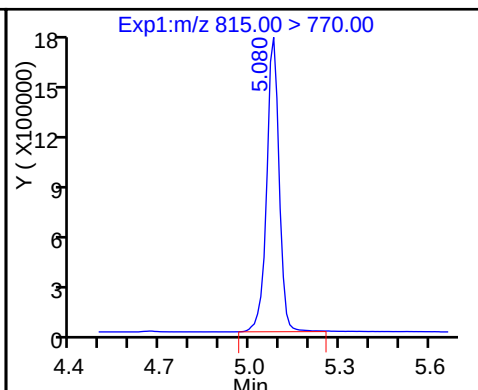
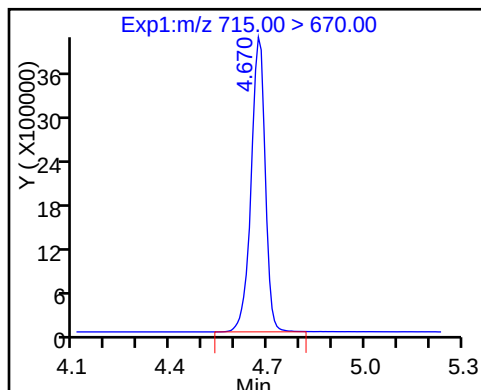
## 42 Perfluorotetradecanoic acid



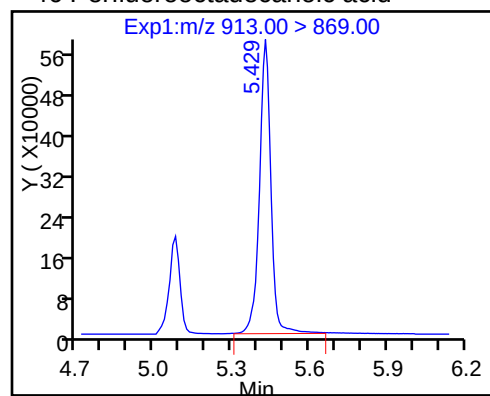
## D 43 13C2-PFTeDA

## D 44 13C2-PFHxDA

## 45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

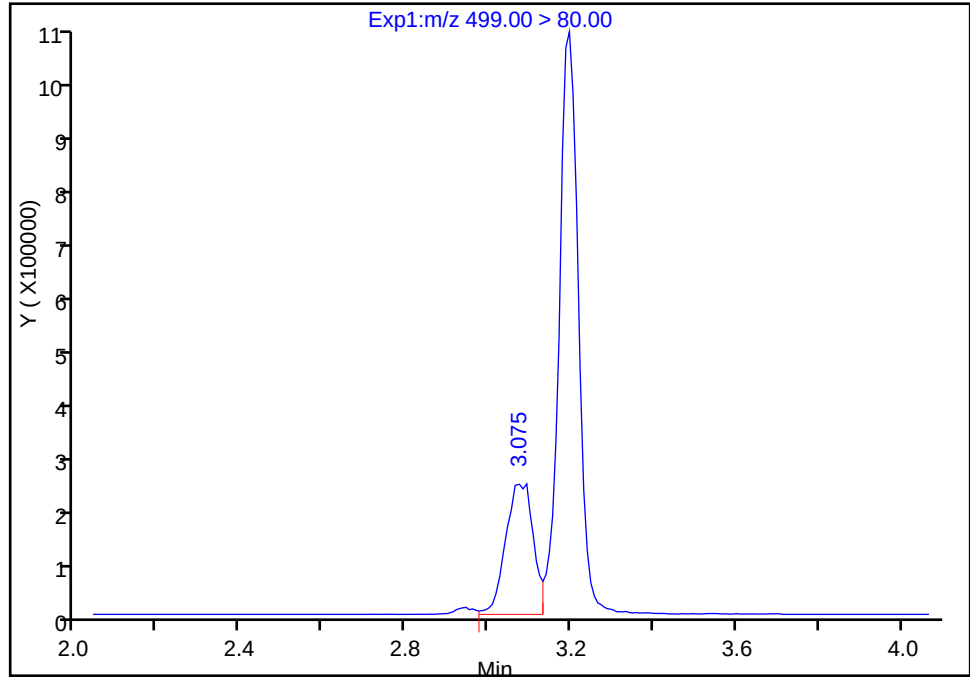
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_065.d  
Injection Date: 12-Mar-2017 03:35:35 Instrument ID: A8\_N  
Lims ID: LCS 320-154076/2-A  
Client ID:  
Operator ID: A8-PC\A8 ALS Bottle#: 2 Worklist Smp#: 3  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

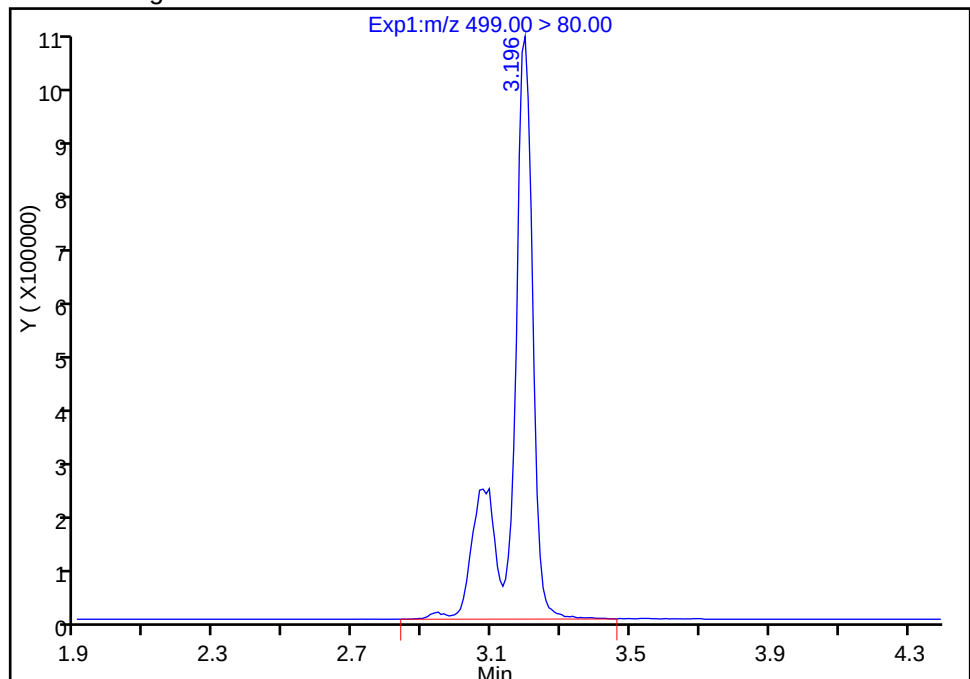
RT: 3.07  
Area: 1090527  
Amount: 5.063849  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 4531434  
Amount: 21.041661  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:03:02  
Audit Action: Manually Integrated

Audit Reason: Isomers  
Page 635 of 691

03/29/2017

## TestAmerica Sacramento

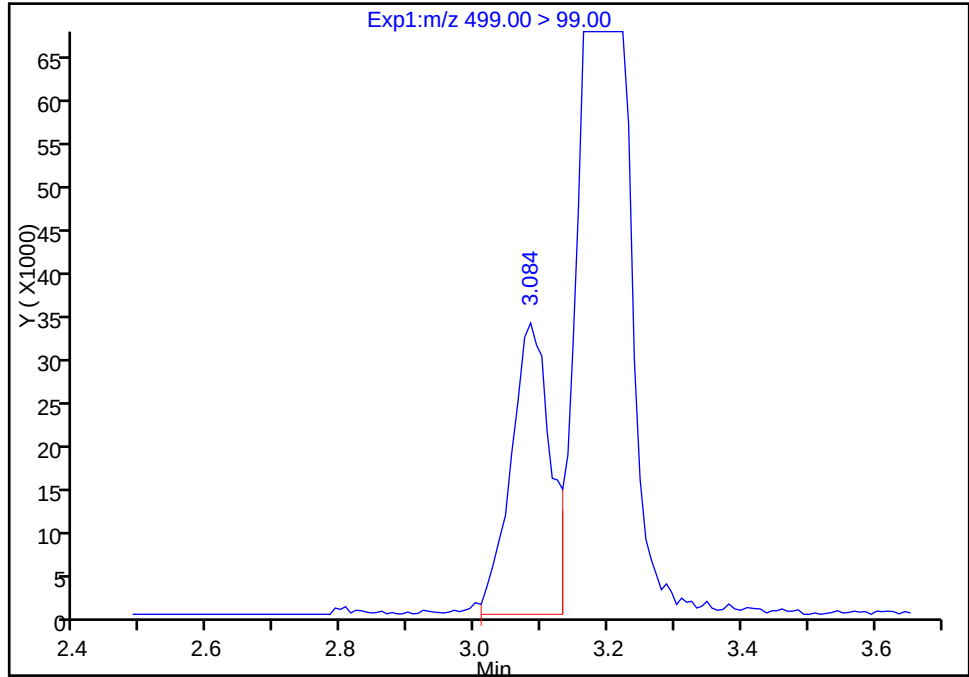
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_065.d  
Injection Date: 12-Mar-2017 03:35:35 Instrument ID: A8\_N  
Lims ID: LCS 320-154076/2-A  
Client ID:  
Operator ID: A8-PCVA8 ALS Bottle#: 2 Worklist Smp#: 3  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

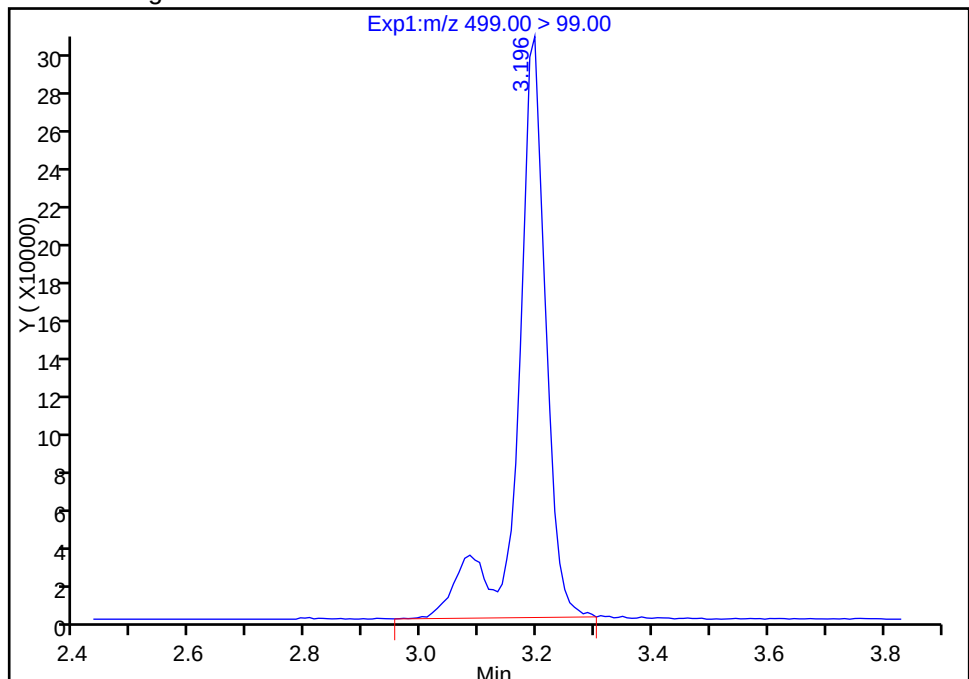
RT: 3.08  
Area: 135226  
Amount: 5.063849  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 1031497  
Amount: 21.041661  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:03:18

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW02-0317-MS MS Lab Sample ID: 320-26324-3 MS  
 Matrix: Water Lab File ID: 2017.03.11D\_069.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 13:05  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 267.3 (mL) Date Analyzed: 03/12/2017 04:05  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 41.0   |   | 2.3 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 40.3   | M | 3.7 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 38.8   |   | 2.3 | 1.9 | 0.86 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 40   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 91   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 100  |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_069.d  
 Lims ID: 320-26324-A-3-B MS  
 Client ID: MEAFF-4BMW02-0317-MS  
 Sample Type: MS  
 Inject. Date: 12-Mar-2017 04:05:36 ALS Bottle#: 6 Worklist Smp#: 7  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-3-b ms  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:18:14 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:18:14

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags      |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|------------|
| D 1 13C4 PFBA                         |       |        |        |        |          |              |                 |      |        |            |
| 217.00 > 172.00                       | 1.539 | 1.538  | 0.001  |        | 6772624  | 23.2         |                 | 47.3 | 388136 |            |
| 2 Perfluorobutyric acid               |       |        |        |        |          |              |                 |      |        |            |
| 212.90 > 169.00                       | 1.539 | 1.538  | 0.001  | 1.000  | 2667222  | 22.8         |                 | 114  | 16715  |            |
| D 3 13C5-PFPeA                        |       |        |        |        |          |              |                 |      |        |            |
| 267.90 > 223.00                       | 1.812 | 1.822  | -0.010 |        | 6529354  | 28.1         |                 | 57.4 | 363200 |            |
| 4 Perfluoropentanoic acid             |       |        |        |        |          |              |                 |      |        |            |
| 262.90 > 219.00                       | 1.822 | 1.822  | 0.0    | 1.000  | 2847108  | 21.8         |                 | 109  | 32219  |            |
| D 47 13C3-PFBS                        |       |        |        |        |          |              |                 |      |        |            |
| 301.90 > 83.00                        | 1.852 | 1.851  | 0.001  |        | 355643   | NC           |                 |      |        |            |
| 5 Perfluorobutanesulfonic acid        |       |        |        |        |          |              |                 |      |        |            |
| 298.90 > 80.00                        | 1.852 | 1.861  | -0.009 | 1.000  | 8623090  | 20.7         |                 | 117  |        |            |
| 298.90 > 99.00                        | 1.852 | 1.861  | -0.009 | 1.000  | 3591723  |              | 2.40(0.00-0.00) |      |        |            |
| 6 Perfluorohexanoic acid              |       |        |        |        |          |              |                 |      |        |            |
| 313.00 > 269.00                       | 2.122 | 2.108  | 0.014  | 1.000  | 2010079  | 22.4         |                 | 112  | 44789  |            |
| D 7 13C2 PFHxA                        |       |        |        |        |          |              |                 |      |        |            |
| 315.00 > 270.00                       | 2.122 | 2.116  | 0.006  |        | 4932558  | 23.4         |                 | 47.8 | 210045 |            |
| 10 Perfluoroheptanoic acid            |       |        |        |        |          |              |                 |      |        |            |
| 363.00 > 319.00                       | 2.452 | 2.447  | 0.005  | 1.000  | 1875227  | 21.9         |                 | 109  | 17745  |            |
| D 9 13C4-PFHpA                        |       |        |        |        |          |              |                 |      |        |            |
| 367.00 > 322.00                       | 2.452 | 2.447  | 0.005  |        | 4342400  | 22.5         |                 | 46.0 | 249967 |            |
| 8 Perfluorohexanesulfonic acid        |       |        |        |        |          |              |                 |      |        | M          |
| 399.00 > 80.00                        | 2.467 | 2.463  | 0.004  | 1.000  | 5811869  | 19.5         |                 | 107  |        | M          |
| D 11 18O2 PFHxS                       |       |        |        |        |          |              |                 |      |        |            |
| 403.00 > 84.00                        | 2.467 | 2.463  | 0.004  |        | 13449240 | 46.2         |                 | 99.8 | 370838 |            |
| 13 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |            |
| 427.00 > 407.00                       | 2.779 | 2.781  | -0.002 | 1.000  | 25886    | NR           |                 | 0.0  |        |            |
| D 12 M2-6:2FTS                        |       |        |        |        |          |              |                 |      |        |            |
| 429.00 > 409.00                       | 2.794 | 2.781  | 0.013  |        | 1419     | 0.0183       |                 | 0.0  |        | 03/29/2017 |



| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.810 | 2.812  | -0.002 | 1.000  | 1835323  | 21.9         |                 | 109  | 17833  |       |
| 413.00 > 169.00                       | 2.817 | 2.812  | 0.005  | 1.003  | 1062121  |              | 1.73(0.90-1.10) |      | 39765  |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.817 | 2.812  | 0.005  |        | 4016236  | 19.6         |                 | 40.0 | 232315 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.817 | 2.820  | -0.003 | 1.000  | 5551279  | 24.5         |                 | 129  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.193 | 3.186  | 0.006  | 1.000  | 4657709  | 21.5         |                 | 116  | 127722 | M     |
| 499.00 > 99.00                        | 3.184 | 3.186  | -0.002 | 0.997  | 1049418  |              | 4.44(0.90-1.10) |      | 51422  | M     |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.193 | 3.186  | 0.006  | 1.000  | 1277371  | 23.8         |                 | 119  | 19770  |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.193 | 3.194  | -0.002 |        | 10293604 | 42.6         |                 | 91.0 | 225922 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.193 | 3.194  | -0.002 |        | 2902460  | 16.3         |                 | 33.3 | 133356 |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.523 | 3.520  | 0.003  |        | 358166   | 0.9761       |                 | 2.0  | 24217  |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.531 | 3.528  | 0.003  | 1.000  | 142739   | 21.7         |                 | 109  | 10024  |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.514 | 3.537  | -0.023 | 0.993  | 658      | NR           |                 | 0.0  |        |       |
| D 26 M2-8:2FTS                        |       |        |        |        |          |              |                 |      |        |       |
| 529.00 > 509.00                       | 3.540 | 3.537  | 0.003  |        | 1126     | 0.0122       |                 | 0.0  |        |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.548 | 3.545  | 0.003  | 1.000  | 1511528  | 23.6         |                 | 118  | 45387  |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.540 | 3.554  | -0.014 |        | 3455403  | 20.7         |                 | 42.3 | 94810  |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.696 | 3.693  | 0.003  |        | 958      | 0.0112       |                 | 0.0  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.696 | 3.704  | -0.008 | 1.000  | 435      | NR           |                 | 0.0  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.851 | 3.850  | 0.001  | 1.000  | 2834883  | 21.6         |                 | 112  |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.868 | 3.867  | 0.001  |        | 3699543  | 28.3         |                 | 57.8 | 214016 |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.842 | 3.867  | -0.025 |        | 3309     | 0.0407       |                 | 0.0  |        |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.868 | 3.876  | -0.008 | 1.000  | 1444913  | 18.9         |                 | 94.3 | 37889  |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 4.010 | 3.876  | 0.134  | 1.044  | 405      | NR           |                 | 0.0  |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 3.964 | 4.019  | -0.055 |        | 392      | 0.004455     |                 | 0.0  |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.154 | 4.159  | -0.005 | 1.000  | 1677159  | 22.4         |                 | 112  | 50123  |       |
| D 36 13C2 PFDaA                       |       |        |        |        |          |              |                 |      |        |       |
| 615.00 > 570.00                       | 4.154 | 4.166  | -0.012 |        | 4015025  | 32.4         |                 | 66.2 | 126384 |       |

| Signal                         | RT    | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|--------------------------------|-------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| D 38 d-N-EtFOSA-M              |       |           |           |           |          |                 |                 |      |        |       |
| 531.00 > 169.00                | 4.418 | 4.202     | 0.216     |           | 5529     | 0.0649          |                 | 0.0  |        |       |
| 41 Perfluorotridecanoic acid   |       |           |           |           |          |                 |                 |      |        |       |
| 663.00 > 619.00                | 4.418 | 4.421     | -0.003    | 1.000     | 1913442  | 26.7            |                 | 134  | 35757  |       |
| 42 Perfluorotetradecanoic acid |       |           |           |           |          |                 |                 |      |        |       |
| 712.50 > 668.90                | 4.653 | 4.658     | -0.005    | 1.000     | 4805030  | 29.8            |                 | 149  | 69594  |       |
| 713.00 > 169.00                | 4.653 | 4.658     | -0.005    | 1.000     | 695173   |                 | 6.91(0.00-0.00) |      | 118834 |       |
| D 43 13C2-PFTeDA               |       |           |           |           |          |                 |                 |      |        |       |
| 715.00 > 670.00                | 4.653 | 4.658     | -0.005    |           | 12053025 | 46.5            |                 | 95.0 | 242202 |       |
| D 44 13C2-PFHxDA               |       |           |           |           |          |                 |                 |      |        |       |
| 815.00 > 770.00                | 5.069 | 5.072     | -0.003    |           | 5384794  | 43.1            |                 | 88.0 | 84557  |       |
| 45 Perfluorohexadecanoic acid  |       |           |           |           |          |                 |                 |      |        |       |
| 813.00 > 769.00                | 5.069 | 5.072     | -0.003    | 1.000     | 2189220  | 28.4            |                 | 142  | 4514   |       |
| 46 Perfluorooctadecanoic acid  |       |           |           |           |          |                 |                 |      |        |       |
| 913.00 > 869.00                | 5.414 | 5.423     | -0.009    | 1.000     | 1519326  | 25.8            |                 | 129  | 1957   |       |

**QC Flag Legend**

## Processing Flags

NR - Missing Quant Standard

NC - Not Calibrated

## Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_069.d

Injection Date: 12-Mar-2017 04:05:36

Instrument ID: A8\_N

Lims ID: 320-26324-A-3-B MS

Client ID: MEAFF-4BMW02-0317-MS

Operator ID: A8-PC\A8

ALS Bottle#: 6

Worklist Smp#: 7

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

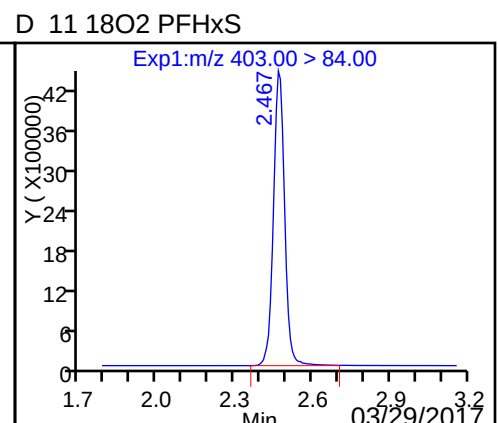
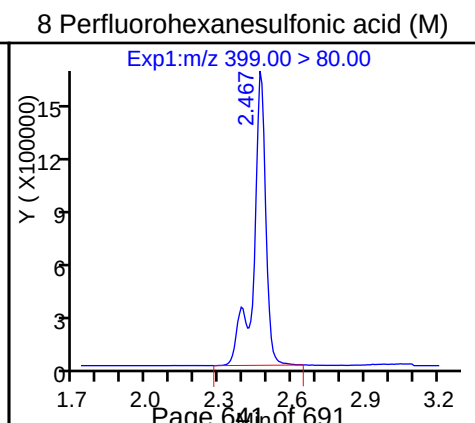
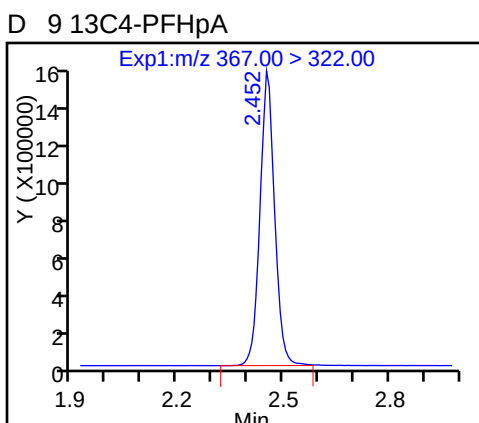
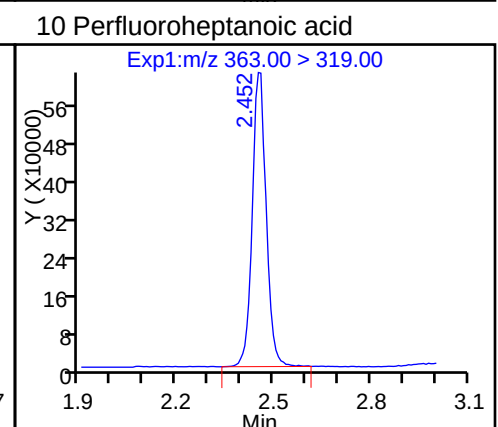
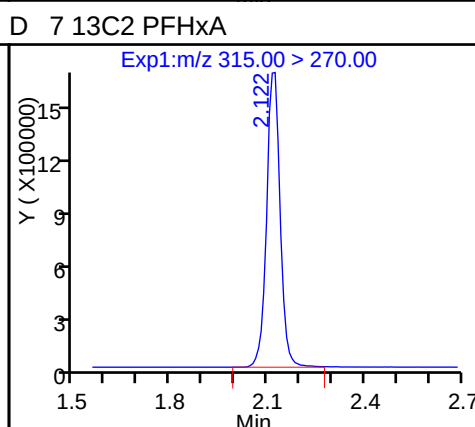
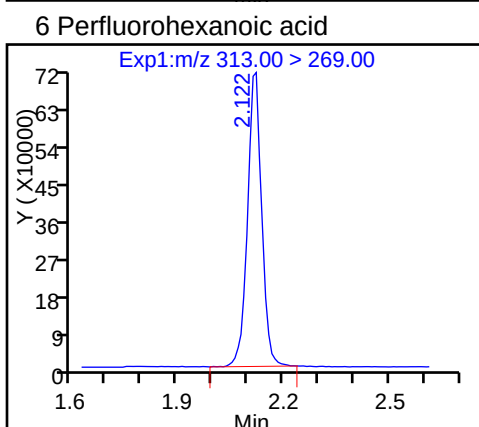
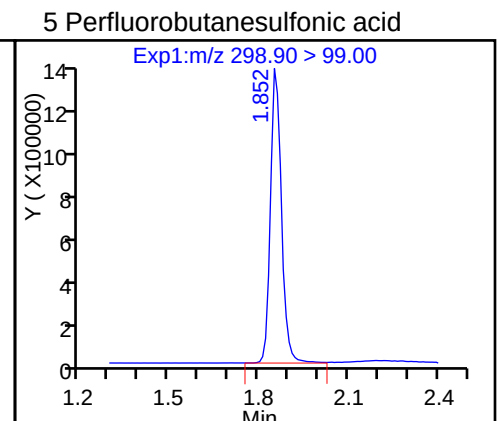
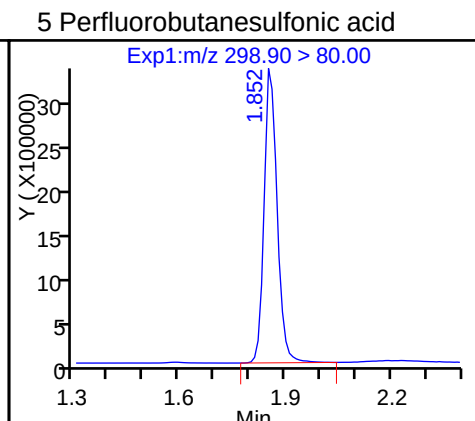
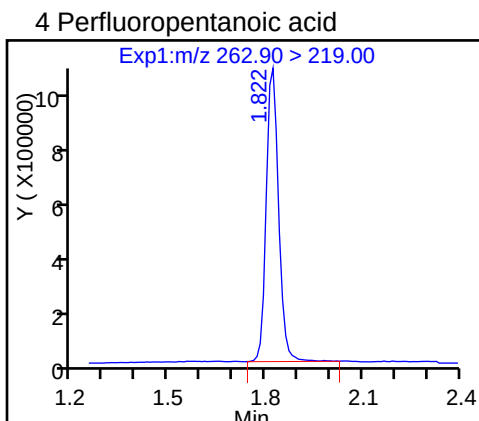
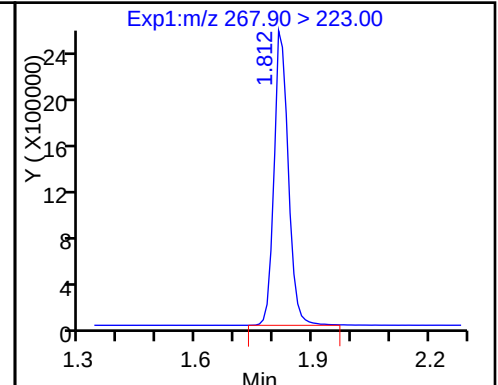
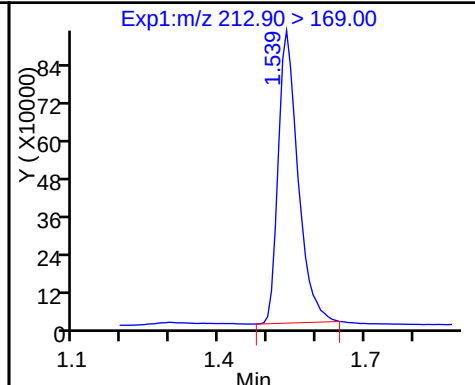
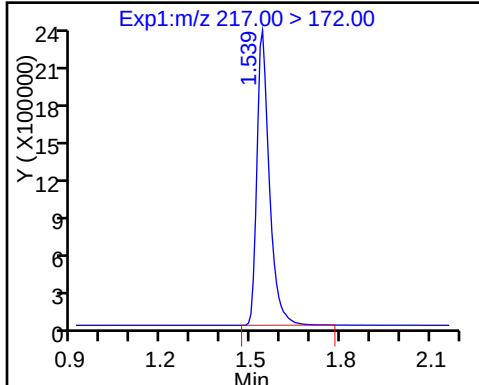
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

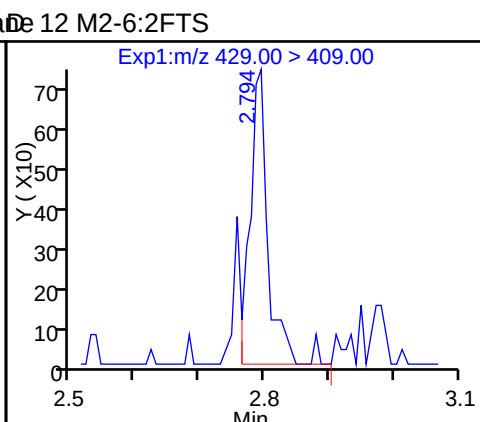
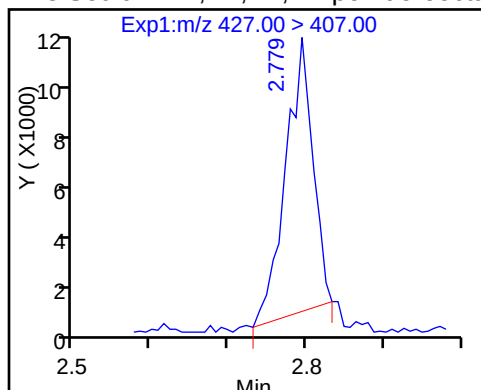
D 1 13C4 PFBA

2 Perfluorobutyric acid

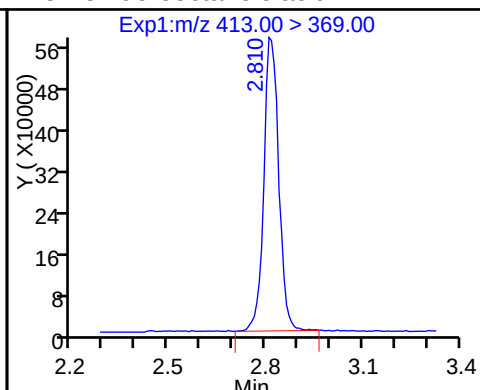
D 3 13C5-PFPeA



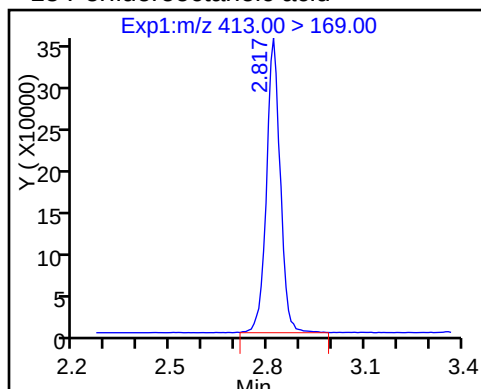
## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS



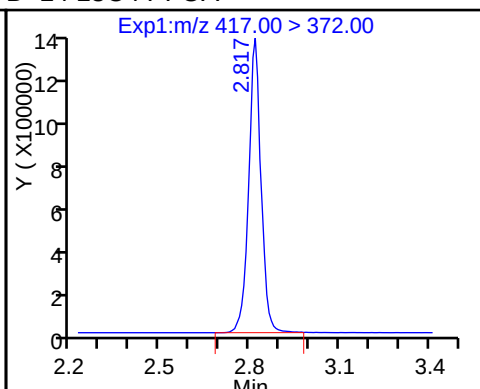
## 15 Perfluorooctanoic acid



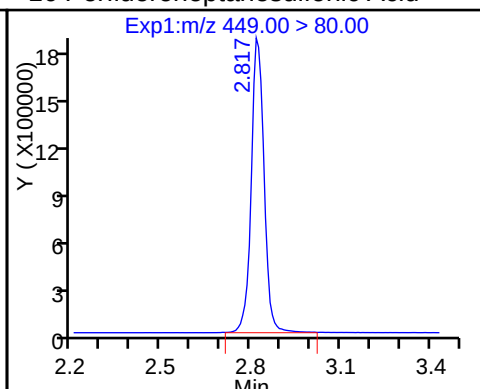
## 15 Perfluorooctanoic acid



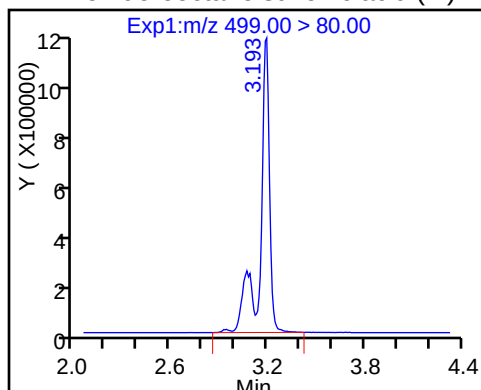
## D 14 13C4 PFOA



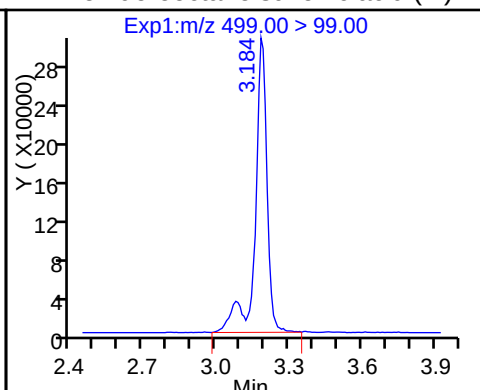
## 16 Perfluoroheptanesulfonic Acid



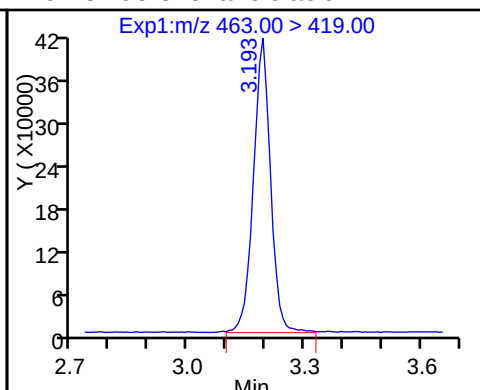
## 17 Perfluorooctane sulfonic acid (M)



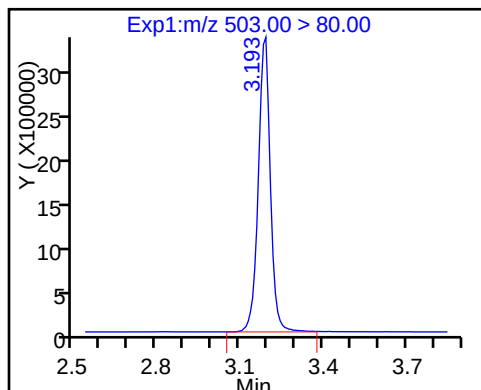
## 17 Perfluorooctane sulfonic acid (M)



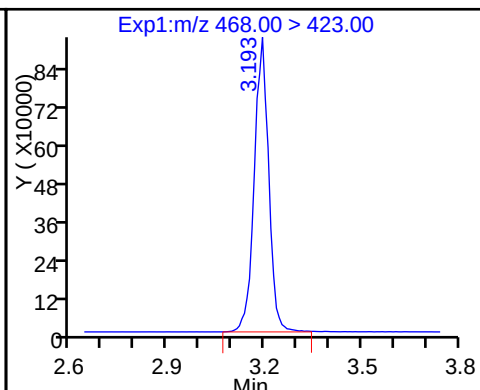
## 20 Perfluorononanoic acid



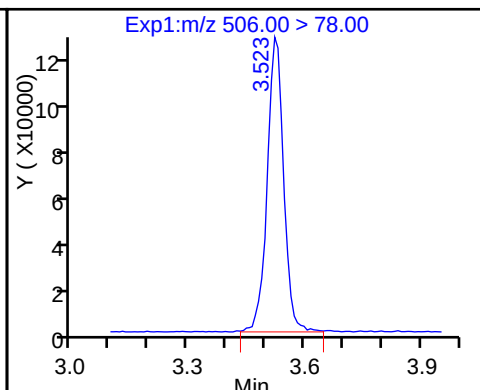
## D 18 13C4 PFOS



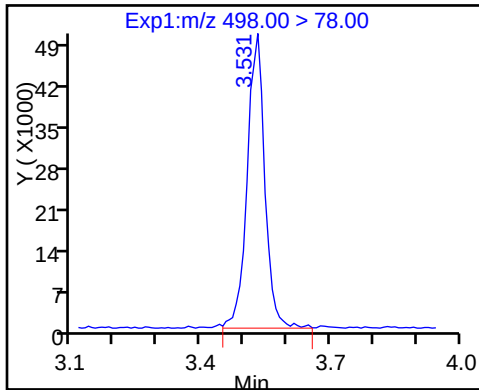
## D 19 13C5 PFNA



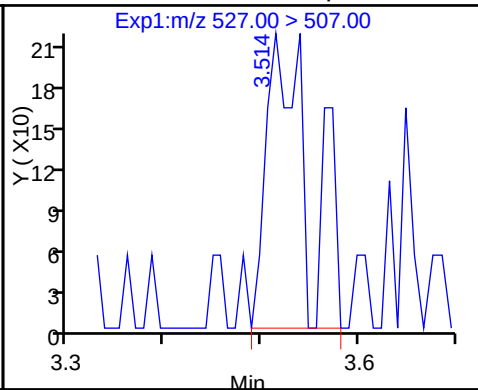
## D 21 13C8 FOSA



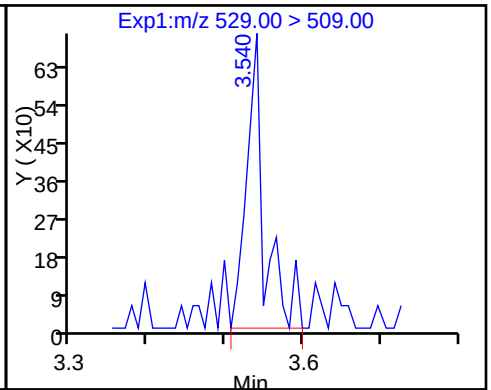
22 Perfluorooctane Sulfonamide



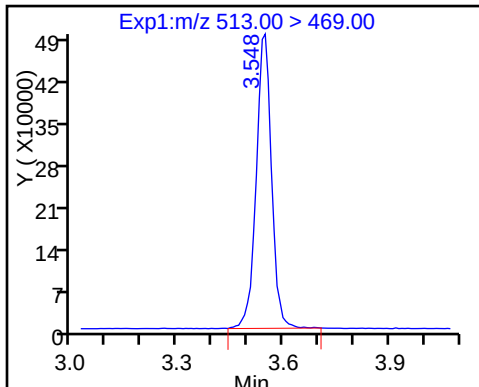
25 Sodium 1H,1H,2H,2H-perfluorooctane



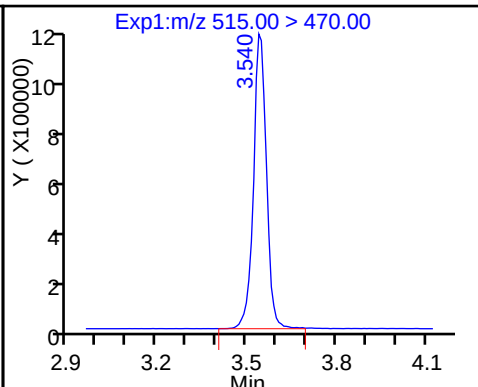
26 M2-8:2FTS



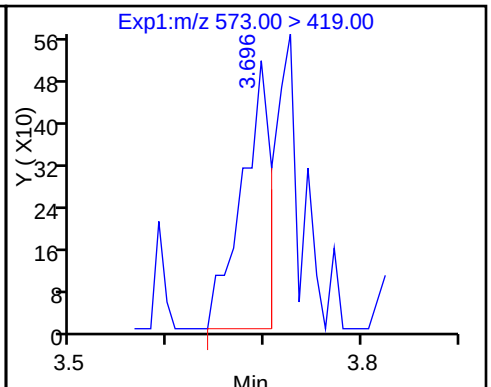
24 Perfluorodecanoic acid



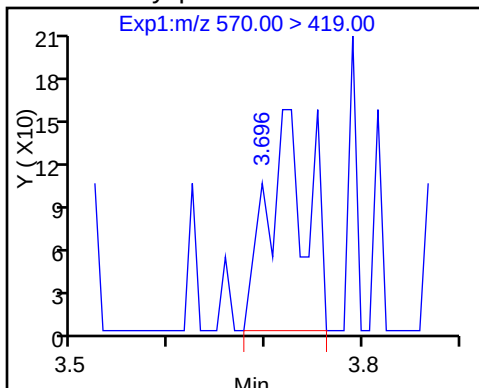
D 23 13C2 PFDA



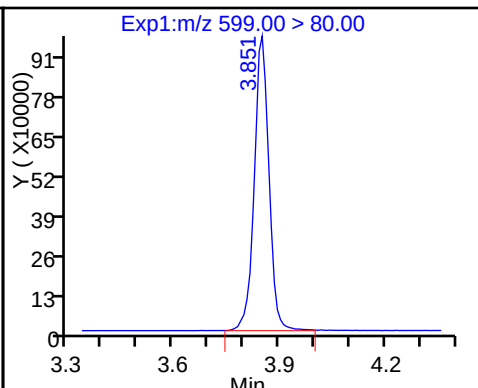
D 27 d3-NMeFOSAA



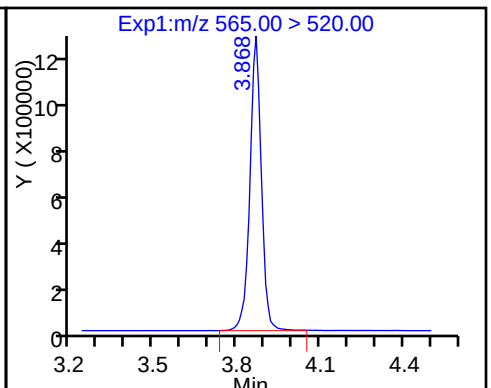
28 N-methyl perfluorooctane sulfonami



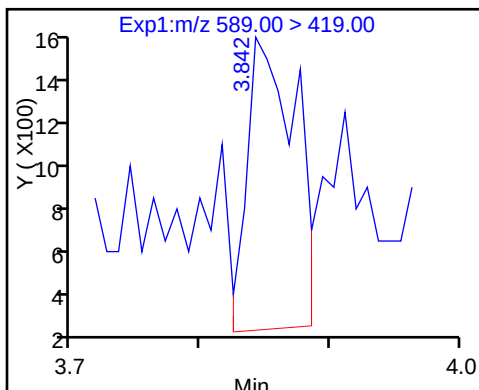
29 Perfluorodecane Sulfonic acid



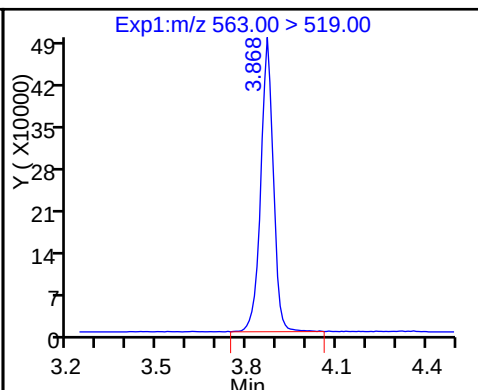
D 30 13C2 PFUnA



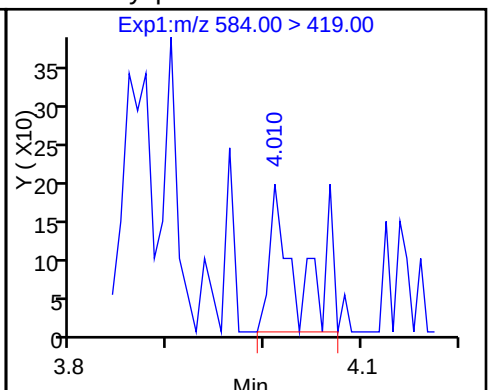
D 32 d5-NEtFOSAA



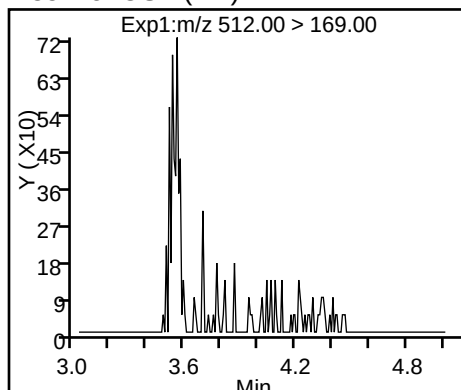
31 Perfluoroundecanoic acid



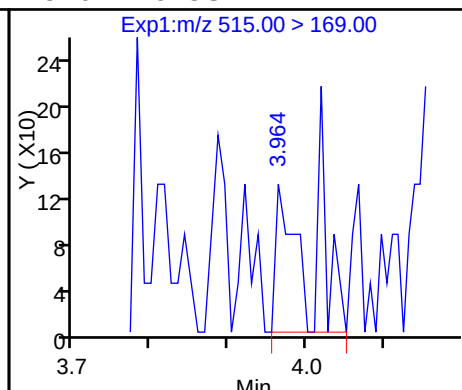
33 N-ethyl perfluorooctane sulfonamid



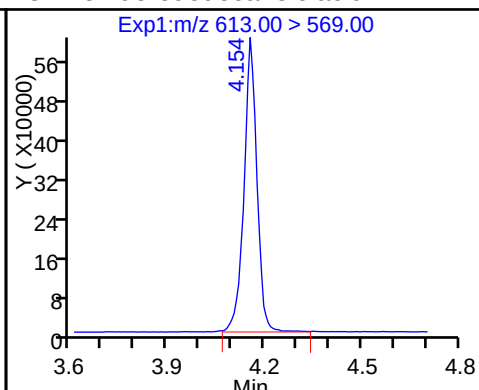
35 MeFOSA (ND)



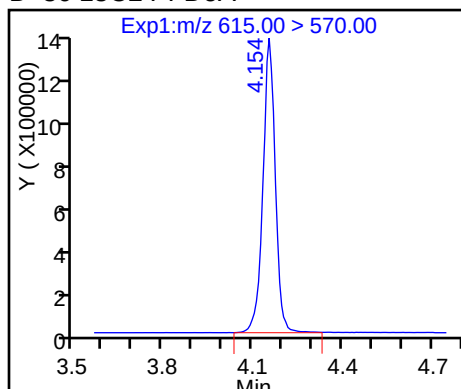
D 34 d-N-MeFOSA-M



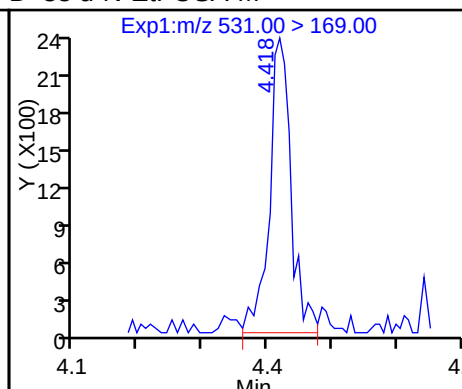
37 Perfluorododecanoic acid



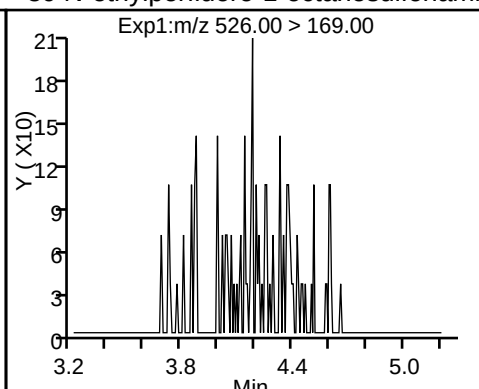
D 36 13C2 PFDaA



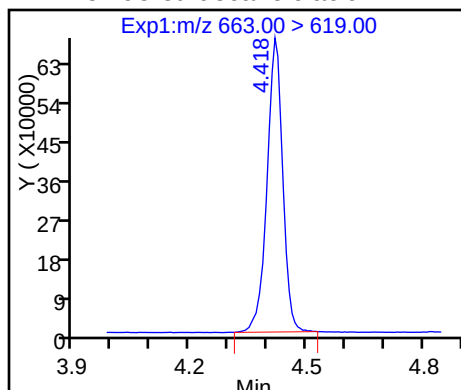
D 38 d-N-EtFOSA-M



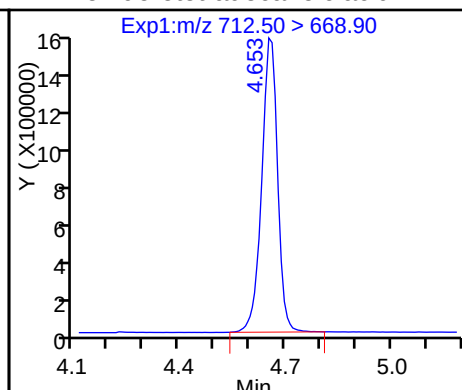
39 N-ethylperfluoro-1-octanesulfonami (ND)



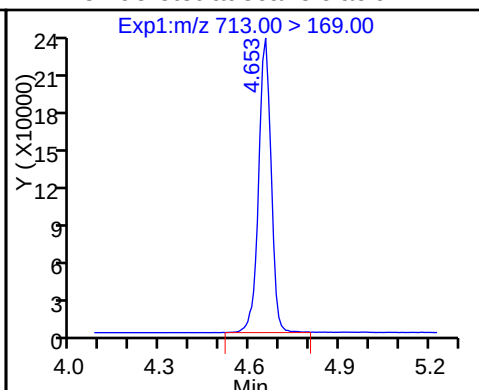
41 Perfluorotridecanoic acid



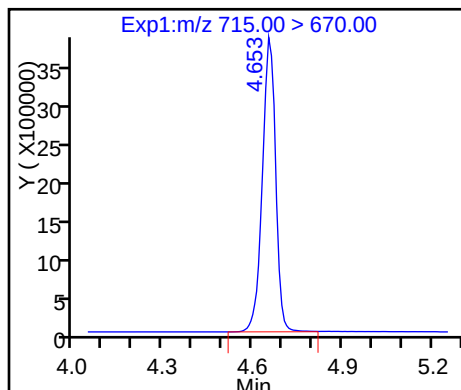
42 Perfluorotetradecanoic acid



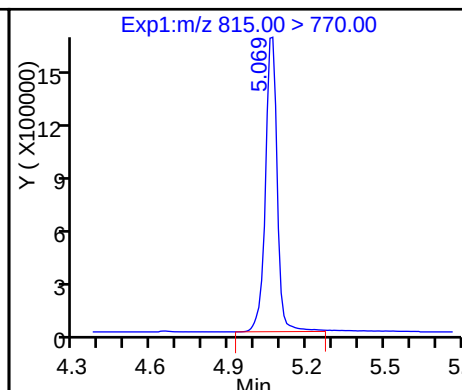
42 Perfluorotetradecanoic acid



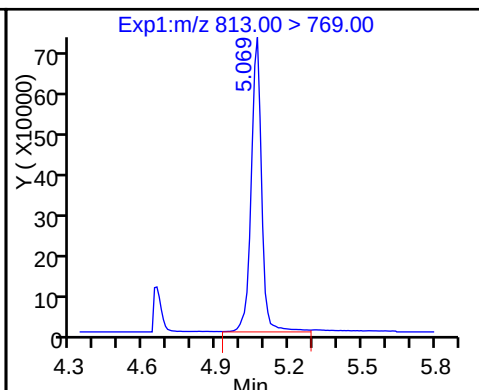
D 43 13C2-PFTeDA



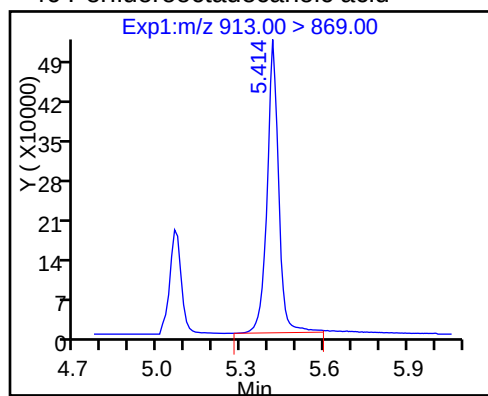
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

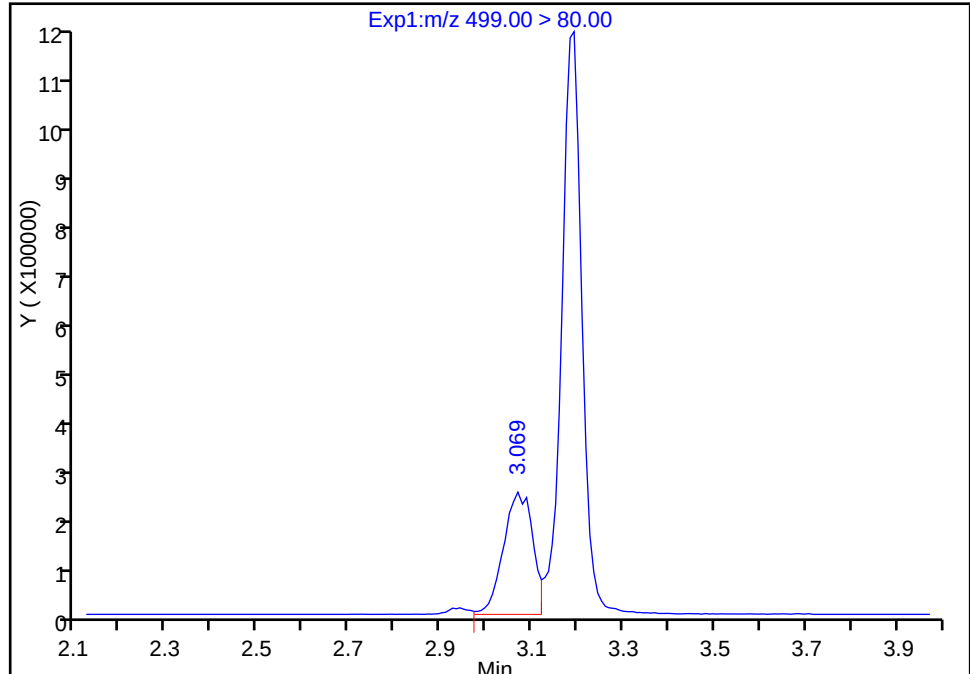
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_069.d  
Injection Date: 12-Mar-2017 04:05:36 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-B MS  
Client ID: MEAFF-4BMW02-0317-MS  
Operator ID: A8-PC\A8 ALS Bottle#: 6 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

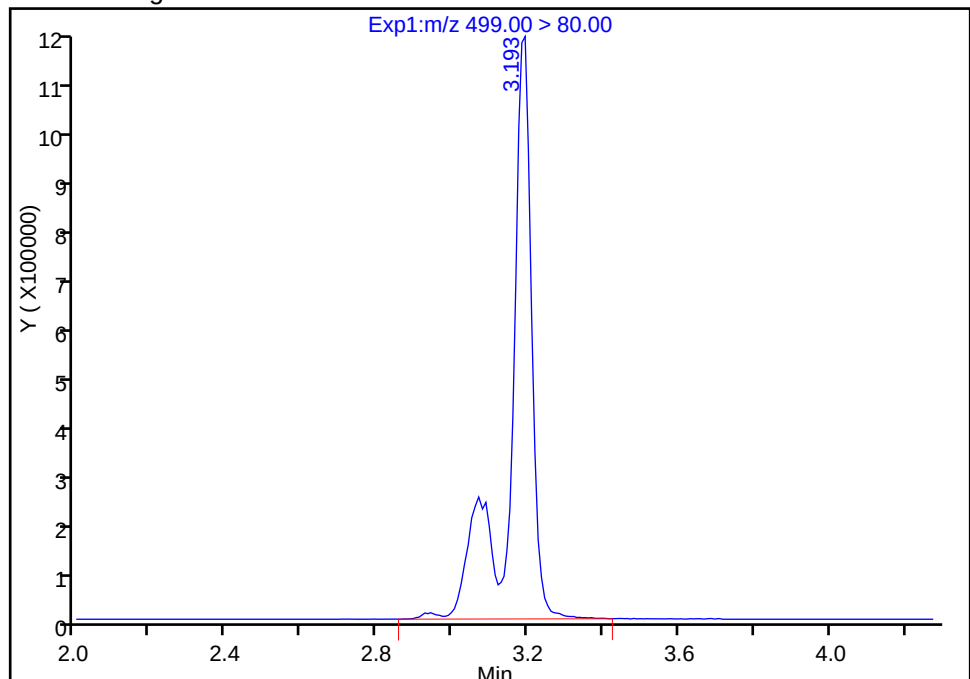
RT: 3.07  
Area: 1064453  
Amount: 4.920536  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.19  
Area: 4657709  
Amount: 21.530705  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:15:43

Audit Action: Manually Integrated

Audit Reason: Isomers



## TestAmerica Sacramento

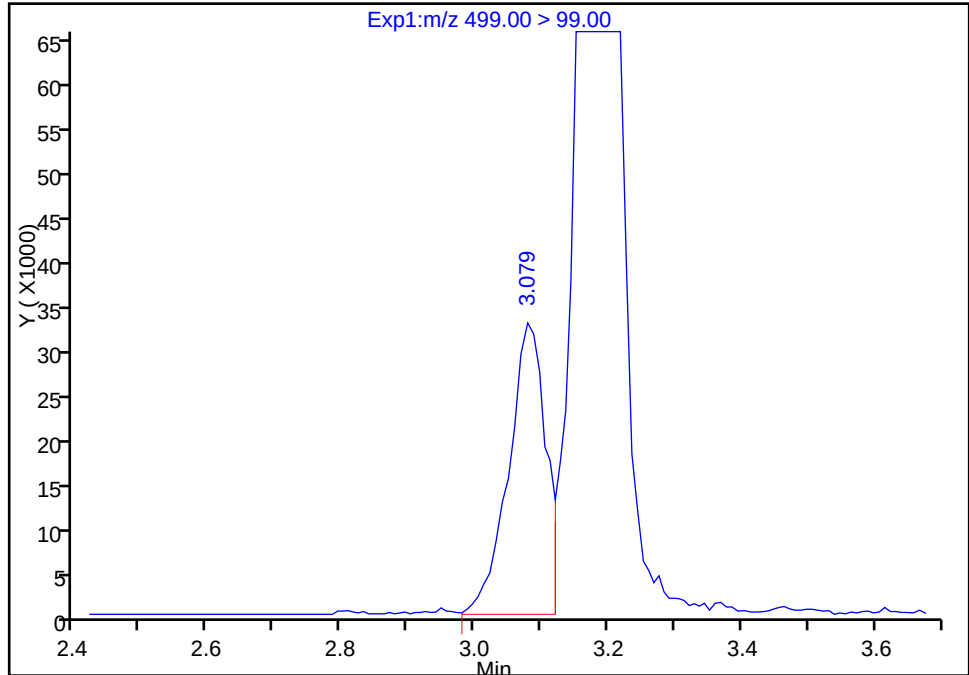
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_069.d  
Injection Date: 12-Mar-2017 04:05:36 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-B MS  
Client ID: MEAFF-4BMW02-0317-MS  
Operator ID: A8-PCVA8 ALS Bottle#: 6 Worklist Smp#: 7  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

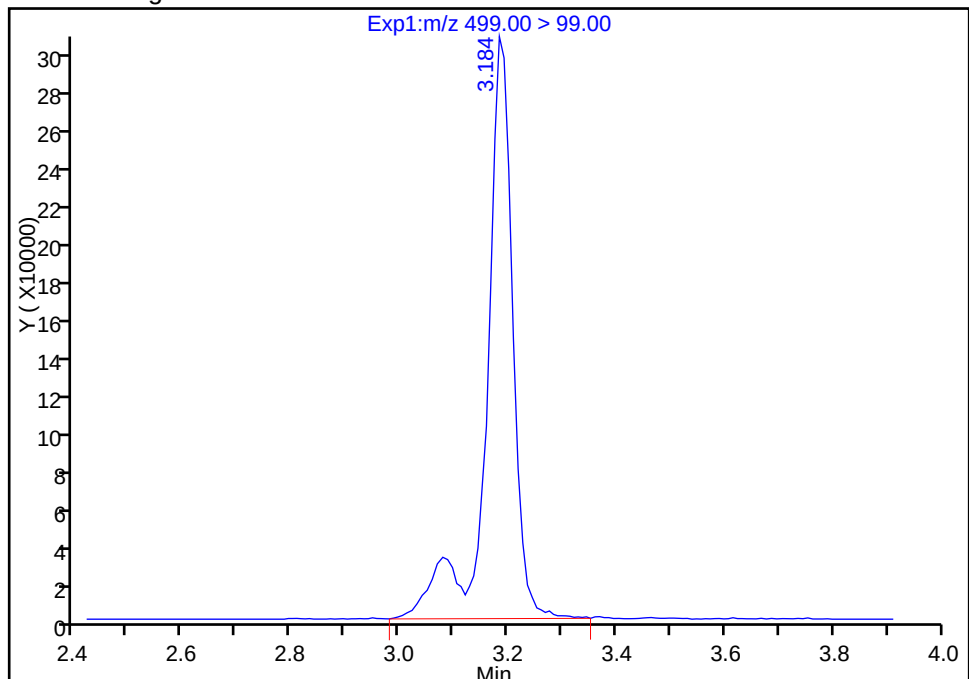
RT: 3.08  
Area: 125117  
Amount: 4.920536  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.18  
Area: 1049418  
Amount: 21.530705  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:16:34

Audit Action: Manually Integrated

Audit Reason: Isomers

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW02-0317-SD MSD Lab Sample ID: 320-26324-3 MSD  
 Matrix: Water Lab File ID: 2017.03.11D\_070.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 13:05  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 268.5 (mL) Date Analyzed: 03/12/2017 04:13  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 40.4   |   | 2.3 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 39.8   | M | 3.7 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 41.2   |   | 2.3 | 1.9 | 0.85 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 49   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 96   |   | 25-150 |

TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_070.d  
 Lims ID: 320-26324-A-3-C MSD  
 Client ID: MEAFF-4BMW02-0317-SD  
 Sample Type: MSD  
 Inject. Date: 12-Mar-2017 04:13:07 ALS Bottle#: 7 Worklist Smp#: 8  
 Injection Vol: 2.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-26324-a-3-c msd  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: A8-PC\A8 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\A8\_N.m  
 Limit Group: LC PFC\_DOD ICAL  
 Last Update: 14-Mar-2017 11:21:08 Calib Date: 01-Mar-2017 11:53:47  
 Integrator: Picker  
 Quant Method: Isotopic Dilution Quant By: Initial Calibration  
 Last ICal File: \\ChromNA\Sacramento\ChromData\A8\_N\20170301-40358.b\2017.03.01CURVE\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK022

First Level Reviewer: changnoit

Date: 14-Mar-2017 11:21:08

| Signal | RT | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits) | %Rec | S/N | Flags |
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|
|--------|----|--------|--------|--------|----------|--------------|---------------|------|-----|-------|

## D 1 13C4 PFBA

217.00 &gt; 172.00 1.546 1.538 0.008 7874082 26.9 55.0 649530

## 2 Perfluorobutyric acid

212.90 &gt; 169.00 1.546 1.538 0.008 1.000 3084871 22.6 113 15507

## D 3 13C5-PFPeA

267.90 &gt; 223.00 1.831 1.822 0.009 7553140 32.5 66.5 501908

## 4 Perfluoropentanoic acid

262.90 &gt; 219.00 1.831 1.822 0.009 1.000 3356586 22.2 111 34602

## D 47 13C3-PFBS

301.90 &gt; 83.00 1.861 1.851 0.010 352708 NC

## 5 Perfluorobutanesulfonic acid

298.90 &gt; 80.00 1.871 1.861 0.010 1.000 8842914 22.1 125

298.90 &gt; 99.00 1.871 1.861 0.010 1.000 3435139 2.57(0.00-0.00)

## 6 Perfluorohexanoic acid

313.00 &gt; 269.00 2.129 2.108 0.021 1.000 2267029 21.7 108 51299

## D 7 13C2 PFHxA

315.00 &gt; 270.00 2.129 2.116 0.013 5750319 27.3 55.7 238931

## 10 Perfluoroheptanoic acid

363.00 &gt; 319.00 2.462 2.447 0.015 1.000 2262359 21.6 108 21533

## D 9 13C4-PFHpA

367.00 &gt; 322.00 2.462 2.447 0.015 5290232 27.4 56.0 211293

## 8 Perfluorohexanesulfonic acid

399.00 &gt; 80.00 2.486 2.463 0.023 1.000 5675887 19.8 109 M

## D 11 18O2 PFHxS

403.00 &gt; 84.00 2.478 2.463 0.015 12915477 44.4 95.9 306010

## 13 Sodium 1H,1H,2H,2H-perfluorooctane

427.00 &gt; 407.00 2.797 2.781 0.016 1.000 32535 NR 0.0

## D 12 M2-6:2FTS

429.00 &gt; 409.00 2.774 2.781 -0.007 1255 0.0163 0.0 03/29/2017

| Signal                                | RT    | EXP RT | DLT RT | REL RT | Response | Amount ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|---------------------------------------|-------|--------|--------|--------|----------|--------------|-----------------|------|--------|-------|
| 15 Perfluorooctanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 413.00 > 369.00                       | 2.828 | 2.812  | 0.016  | 1.000  | 2245580  | 21.7         |                 | 109  | 23325  |       |
| 413.00 > 169.00                       | 2.828 | 2.812  | 0.016  | 1.000  | 1278611  |              | 1.76(0.90-1.10) |      | 51584  |       |
| D 14 13C4 PFOA                        |       |        |        |        |          |              |                 |      |        |       |
| 417.00 > 372.00                       | 2.828 | 2.812  | 0.016  |        | 4955093  | 24.2         |                 | 49.4 | 232993 |       |
| 16 Perfluoroheptanesulfonic Acid      |       |        |        |        |          |              |                 |      |        |       |
| 449.00 > 80.00                        | 2.836 | 2.820  | 0.016  | 1.000  | 5357800  | 23.8         |                 | 125  |        |       |
| 17 Perfluorooctane sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 499.00 > 80.00                        | 3.203 | 3.186  | 0.017  | 1.000  | 4588584  | 21.4         |                 | 115  | 229036 | M     |
| 499.00 > 99.00                        | 3.203 | 3.186  | 0.017  | 1.000  | 1040929  |              | 4.41(0.90-1.10) |      | 39671  | M     |
| 20 Perfluorononanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 463.00 > 419.00                       | 3.203 | 3.186  | 0.017  | 1.000  | 1524180  | 23.8         |                 | 119  | 26568  |       |
| D 18 13C4 PFOS                        |       |        |        |        |          |              |                 |      |        |       |
| 503.00 > 80.00                        | 3.203 | 3.194  | 0.009  |        | 10218158 | 42.3         |                 | 90.4 | 190542 |       |
| D 19 13C5 PFNA                        |       |        |        |        |          |              |                 |      |        |       |
| 468.00 > 423.00                       | 3.203 | 3.194  | 0.009  |        | 3464496  | 19.5         |                 | 39.8 | 120291 |       |
| D 21 13C8 FOSA                        |       |        |        |        |          |              |                 |      |        |       |
| 506.00 > 78.00                        | 3.533 | 3.520  | 0.013  |        | 599974   | 1.64         |                 | 3.3  | 50516  |       |
| 22 Perfluorooctane Sulfonamide        |       |        |        |        |          |              |                 |      |        |       |
| 498.00 > 78.00                        | 3.533 | 3.528  | 0.005  | 1.000  | 242492   | 22.0         |                 | 110  | 15727  |       |
| 25 Sodium 1H,1H,2H,2H-perfluorooctane |       |        |        |        |          |              |                 |      |        |       |
| 527.00 > 507.00                       | 3.559 | 3.537  | 0.022  | 1.000  | 1044     | NR           |                 | 0.0  |        |       |
| 24 Perfluorodecanoic acid             |       |        |        |        |          |              |                 |      |        |       |
| 513.00 > 469.00                       | 3.559 | 3.545  | 0.014  | 1.000  | 1780360  | 23.4         |                 | 117  | 48939  |       |
| D 23 13C2 PFDA                        |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 470.00                       | 3.550 | 3.554  | -0.004 |        | 4108617  | 24.6         |                 | 50.3 | 91023  |       |
| D 27 d3-NMeFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 573.00 > 419.00                       | 3.690 | 3.693  | -0.003 |        | 1126     | 0.0132       |                 | 0.0  |        |       |
| 28 N-methyl perfluorooctane sulfonami |       |        |        |        |          |              |                 |      |        |       |
| 570.00 > 419.00                       | 3.690 | 3.704  | -0.014 | 1.000  | 347      | NR           |                 | 0.0  |        |       |
| 29 Perfluorodecane Sulfonic acid      |       |        |        |        |          |              |                 |      |        |       |
| 599.00 > 80.00                        | 3.863 | 3.850  | 0.013  | 1.000  | 2825240  | 21.7         |                 | 113  |        |       |
| D 30 13C2 PFUnA                       |       |        |        |        |          |              |                 |      |        |       |
| 565.00 > 520.00                       | 3.880 | 3.867  | 0.013  |        | 4079946  | 31.2         |                 | 63.7 | 149776 |       |
| D 32 d5-NEtFOSAA                      |       |        |        |        |          |              |                 |      |        |       |
| 589.00 > 419.00                       | 3.846 | 3.867  | -0.021 |        | 2976     | 0.0366       |                 | 0.0  |        |       |
| 31 Perfluoroundecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 563.00 > 519.00                       | 3.880 | 3.876  | 0.004  | 1.000  | 1655484  | 19.6         |                 | 98.0 | 39856  |       |
| 33 N-ethyl perfluorooctane sulfonamid |       |        |        |        |          |              |                 |      |        |       |
| 584.00 > 419.00                       | 3.863 | 3.876  | -0.013 | 1.005  | 943      | NR           |                 | 0.0  |        |       |
| D 34 d-N-MeFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 515.00 > 169.00                       | 3.837 | 4.019  | -0.182 |        | 416      | 0.004728     |                 | 0.0  |        |       |
| 37 Perfluorododecanoic acid           |       |        |        |        |          |              |                 |      |        |       |
| 613.00 > 569.00                       | 4.163 | 4.159  | 0.004  | 1.000  | 1798328  | 22.2         |                 | 111  | 54996  |       |
| D 36 13C2 PFDoA                       |       |        |        |        |          |              |                 |      |        |       |
| 615.00 > 570.00                       | 4.170 | 4.166  | 0.004  |        | 4336255  | 35.0         |                 | 71.5 | 126451 |       |
| D 38 d-N-EtFOSA-M                     |       |        |        |        |          |              |                 |      |        |       |
| 531.00 > 169.00                       | 4.413 | 4.202  | 0.211  |        | 4450     | 0.0522       |                 | 0.0  |        |       |

| Signal                         | RT              | EXP<br>RT | DLT<br>RT | REL<br>RT | Response | Amount<br>ng/ml | Ratio(Limits)   | %Rec | S/N    | Flags |
|--------------------------------|-----------------|-----------|-----------|-----------|----------|-----------------|-----------------|------|--------|-------|
| 41 Perfluorotridecanoic acid   | 663.00 > 619.00 | 4.428     | 4.421     | 0.007     | 1.000    | 2121784         | 27.4            | 137  | 42303  |       |
| 42 Perfluorotetradecanoic acid | 712.50 > 668.90 | 4.672     | 4.658     | 0.014     | 1.000    | 5197111         | 29.8            | 149  | 48337  |       |
|                                | 713.00 > 169.00 | 4.664     | 4.658     | 0.006     | 0.998    | 743509          | 6.99(0.00-0.00) |      | 82384  |       |
| D 43 13C2-PFTeDA               | 715.00 > 670.00 | 4.664     | 4.658     | 0.006     |          | 13251770        | 51.1            | 104  | 318439 |       |
| D 44 13C2-PFHxDA               | 815.00 > 770.00 | 5.081     | 5.072     | 0.009     |          | 5586147         | 44.7            | 91.2 | 136455 |       |
| 45 Perfluorohexadecanoic acid  | 813.00 > 769.00 | 5.081     | 5.072     | 0.009     | 1.000    | 2183111         | 26.2            | 131  | 4052   |       |
| 46 Perfluorooctadecanoic acid  | 913.00 > 869.00 | 5.429     | 5.423     | 0.006     | 1.000    | 1620537         | 25.5            | 127  | 1969   |       |

**QC Flag Legend**

## Processing Flags

NR - Missing Quant Standard

NC - Not Calibrated

## Review Flags

M - Manually Integrated

## TestAmerica Sacramento

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_070.d

Injection Date: 12-Mar-2017 04:13:07

Instrument ID: A8\_N

Lims ID: 320-26324-A-3-C MSD

Client ID: MEAFF-4BMW02-0317-SD

Operator ID: A8-PC\A8

ALS Bottle#: 7

Worklist Smp#: 8

Injection Vol: 2.0 ul

Dil. Factor: 1.0000

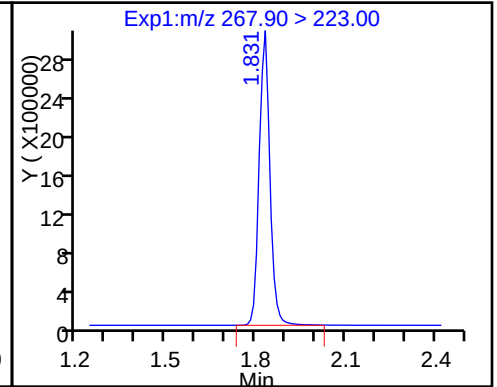
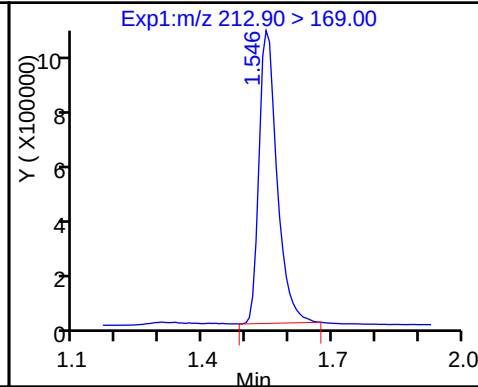
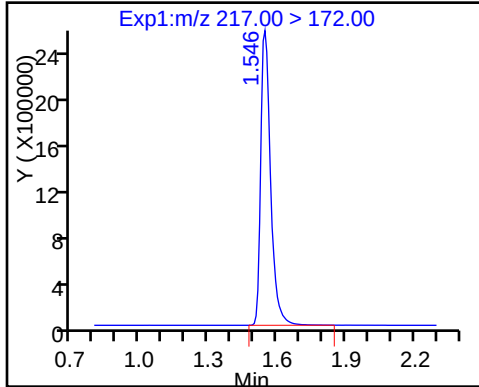
Method: A8\_N

Limit Group: LC PFC\_DOD ICAL

D 1 13C4 PFBA

2 Perfluorobutyric acid

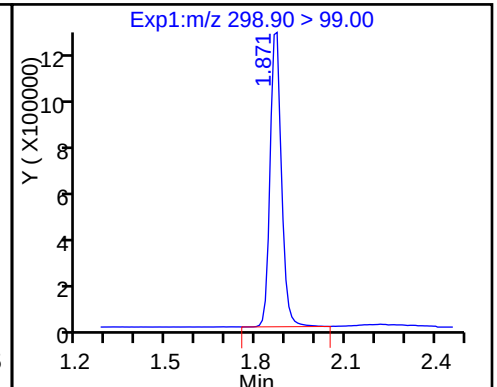
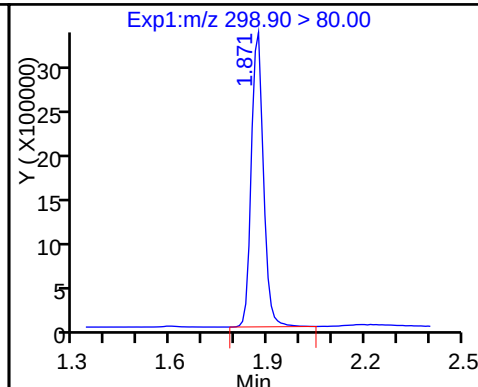
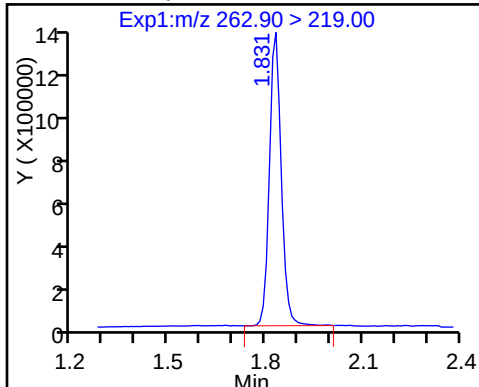
D 3 13C5-PFPeA



4 Perfluoropentanoic acid

5 Perfluorobutanesulfonic acid

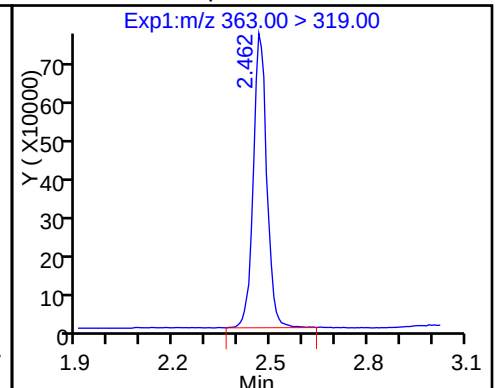
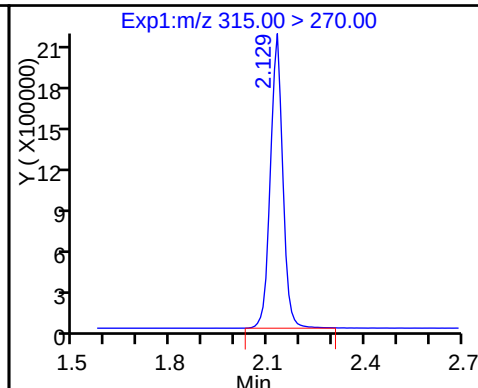
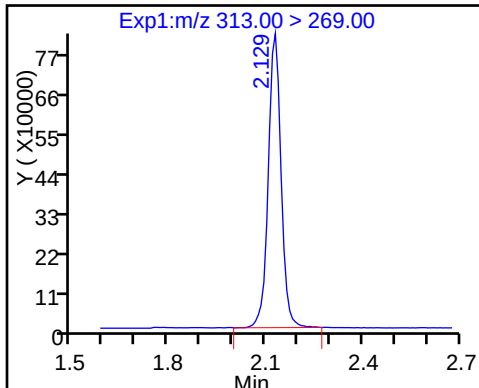
5 Perfluorobutanesulfonic acid



6 Perfluorohexanoic acid

D 7 13C2 PFHxA

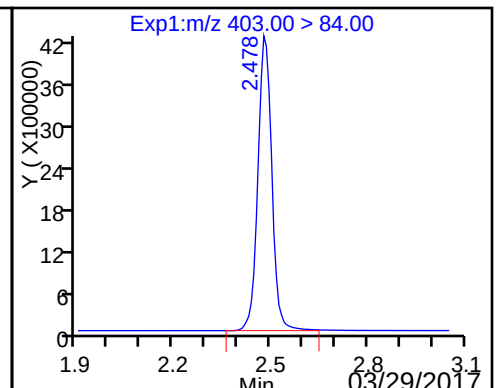
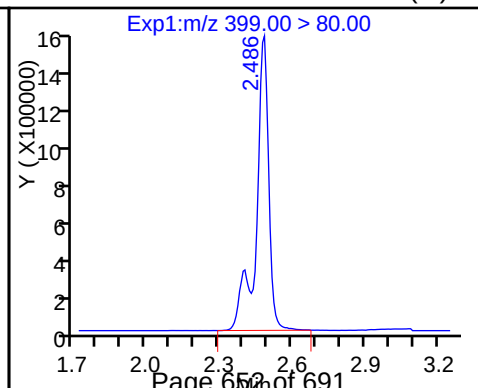
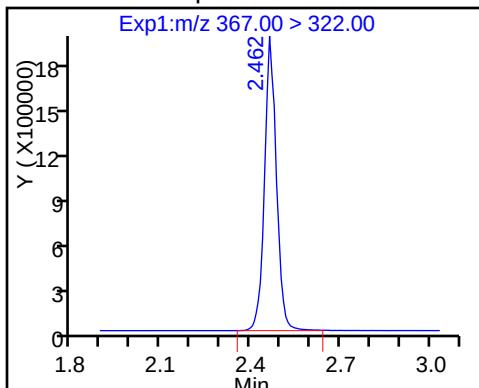
10 Perfluoroheptanoic acid



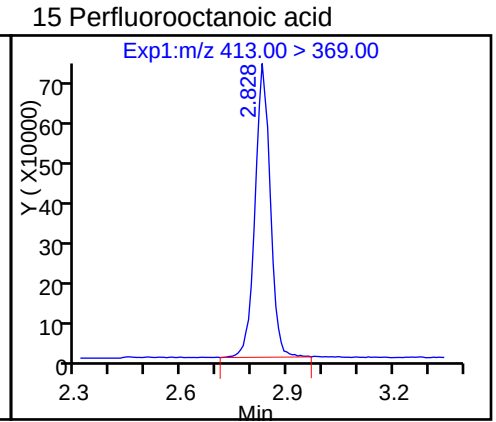
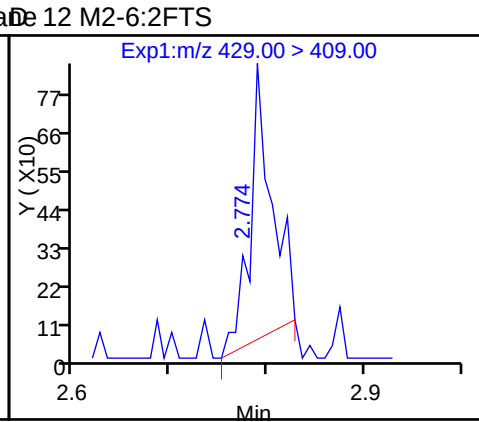
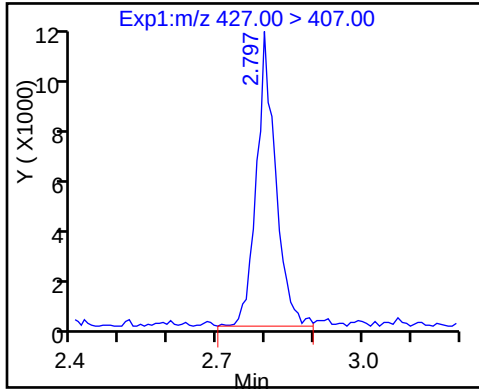
D 9 13C4-PFHpA

8 Perfluorohexanesulfonic acid (M)

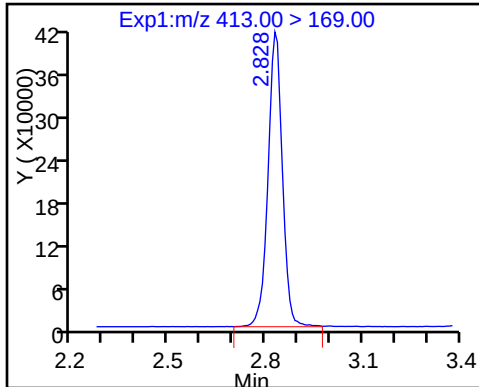
D 11 18O2 PFHxS



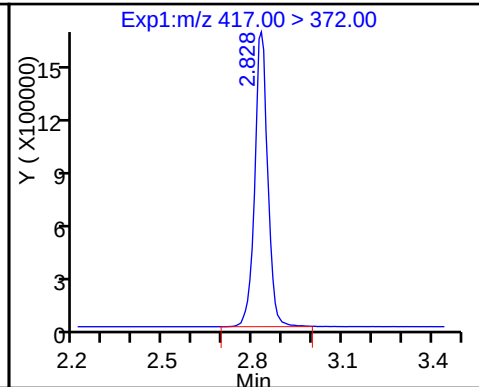
## 13 Sodium 1H,1H,2H,2H-perfluorooctadec-12 M2-6:2FTS



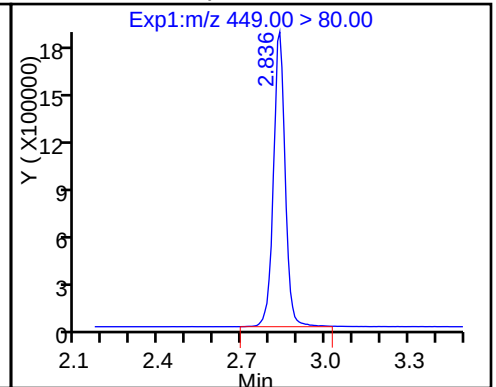
## 15 Perfluorooctanoic acid



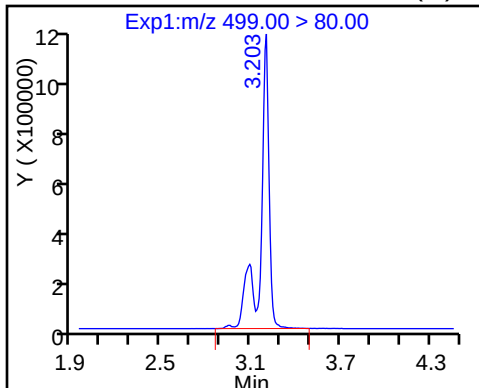
## D 14 13C4 PFOA



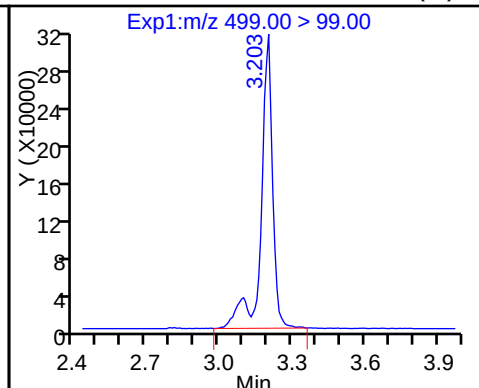
## 16 Perfluoroheptanesulfonic Acid



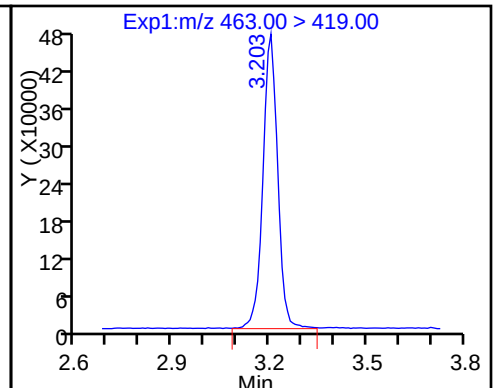
## 17 Perfluorooctane sulfonic acid (M)



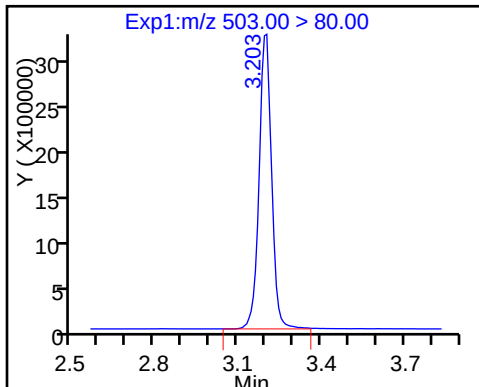
## 17 Perfluorooctane sulfonic acid (M)



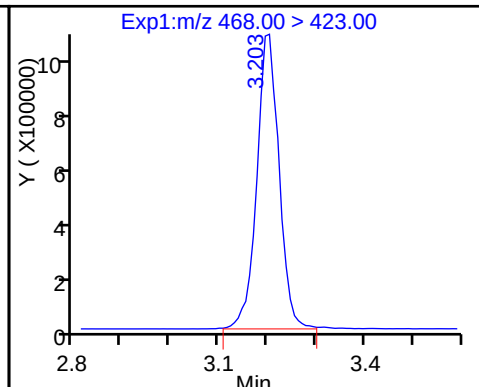
## 20 Perfluorononanoic acid



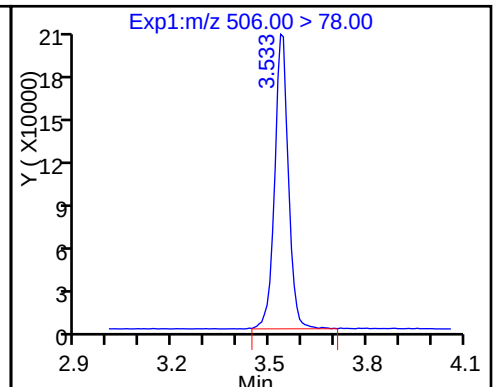
## D 18 13C4 PFOS



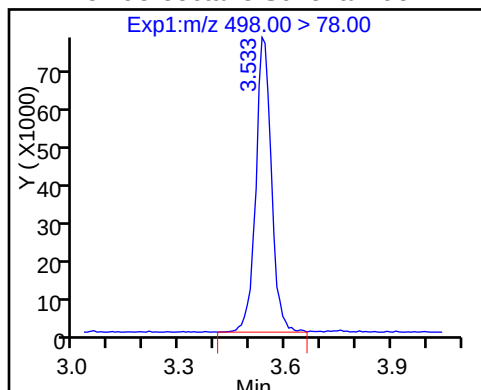
## D 19 13C5 PFNA



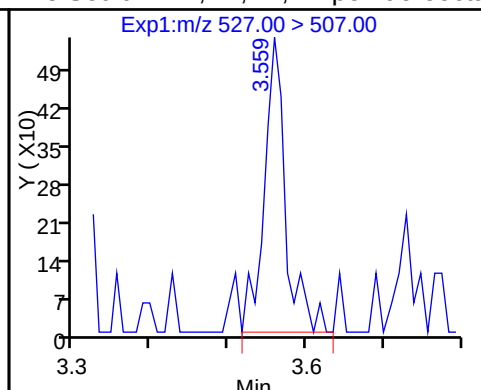
## D 21 13C8 FOSA



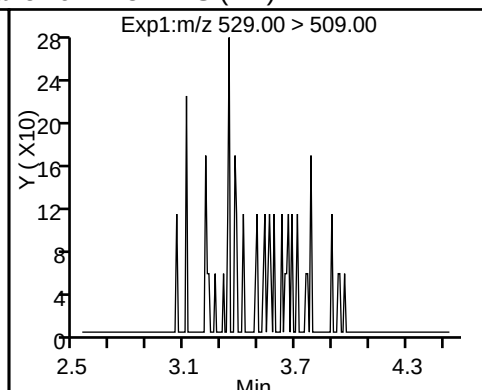
22 Perfluorooctane Sulfonamide



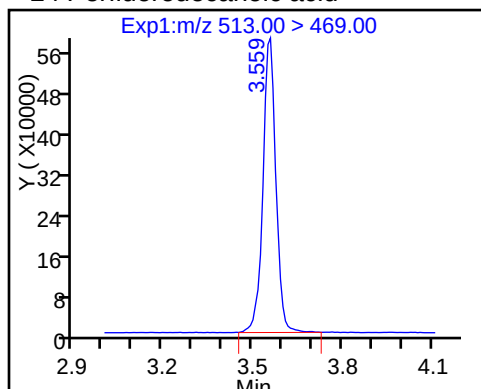
25 Sodium 1H,1H,2H,2H-perfluorooctane



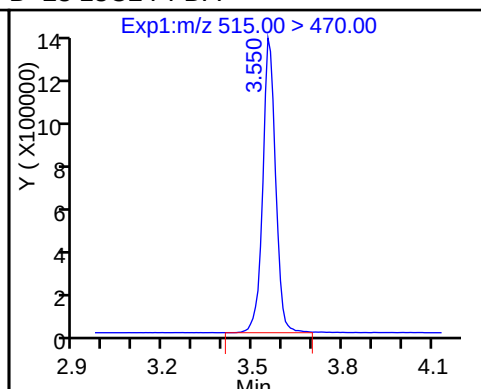
26 M2-8:2FTS (ND)



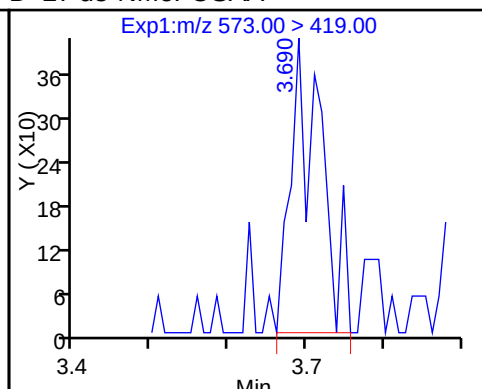
24 Perfluorodecanoic acid



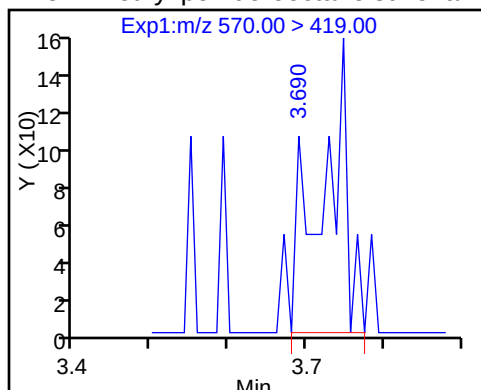
D 23 13C2 PFDA



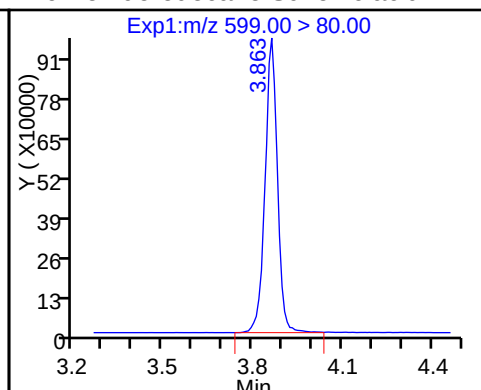
D 27 d3-NMeFOSAA



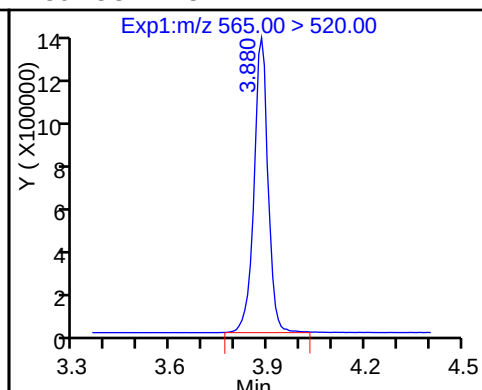
28 N-methyl perfluorooctane sulfonami



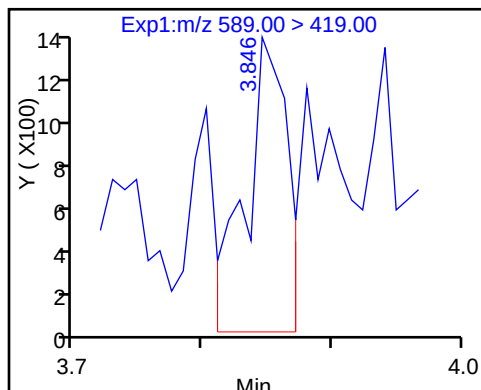
29 Perfluorodecane Sulfonic acid



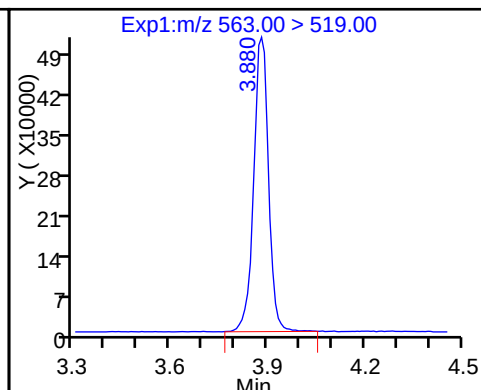
D 30 13C2 PFUnA



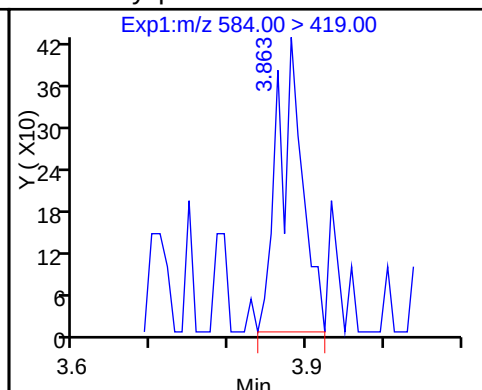
D 32 d5-NEtFOSAA



31 Perfluoroundecanoic acid

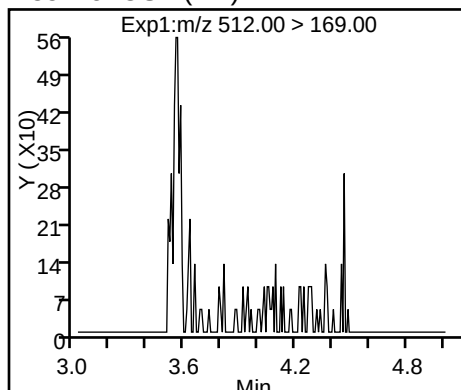


33 N-ethyl perfluorooctane sulfonamid

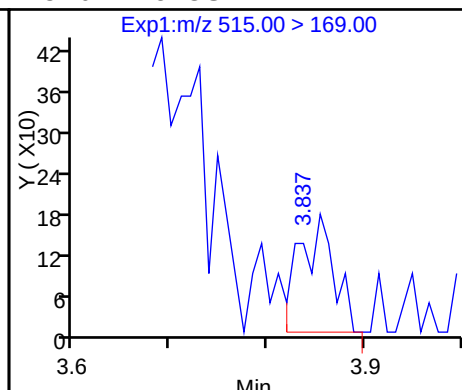




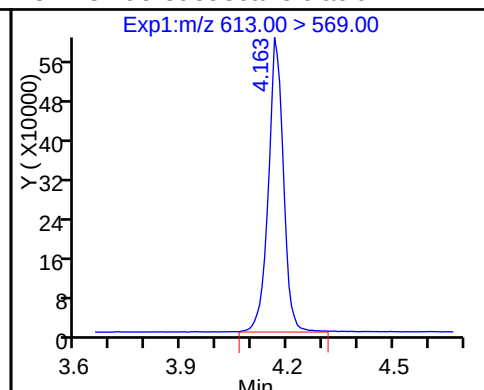
35 MeFOSA (ND)



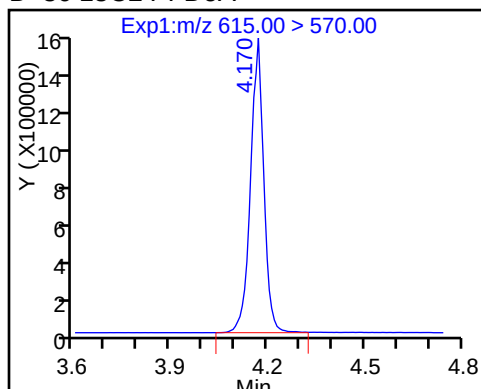
D 34 d-N-MeFOSA-M



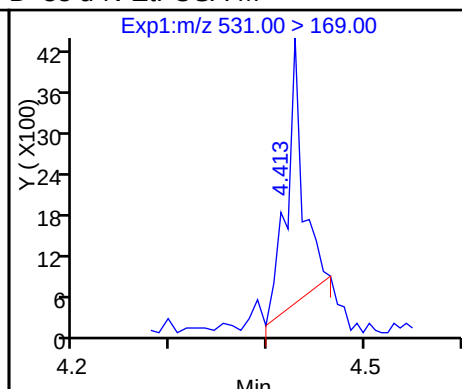
37 Perfluorododecanoic acid



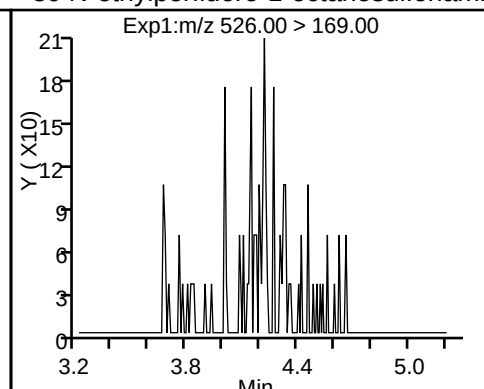
D 36 13C2 PFDaA



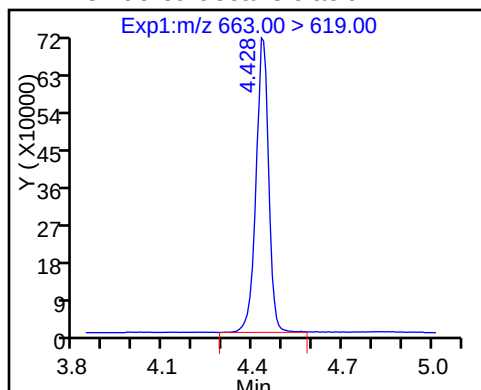
D 38 d-N-EtFOSA-M



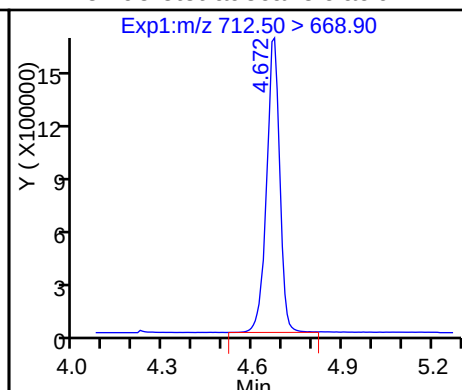
39 N-ethylperfluoro-1-octanesulfonami (ND)



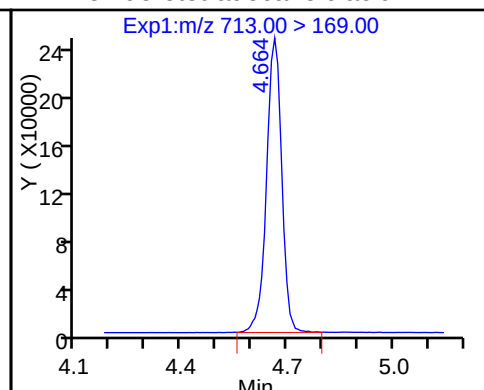
41 Perfluorotridecanoic acid



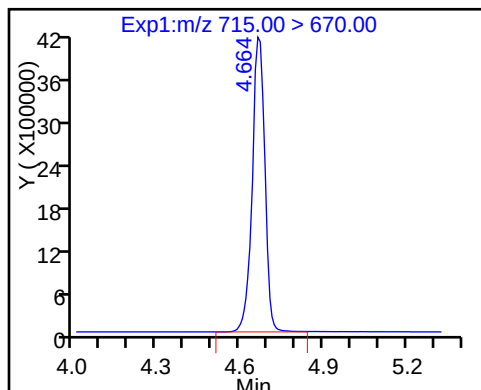
42 Perfluorotetradecanoic acid



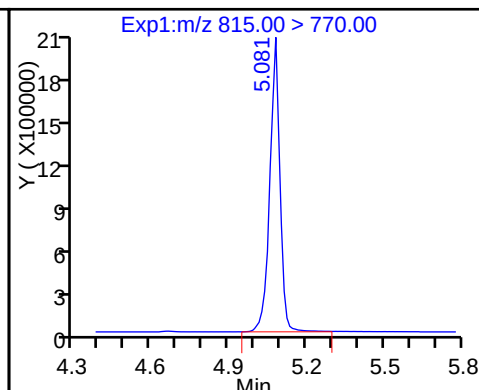
42 Perfluorotetradecanoic acid



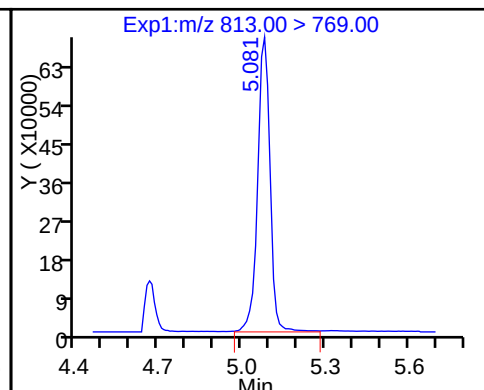
D 43 13C2-PFTeDA



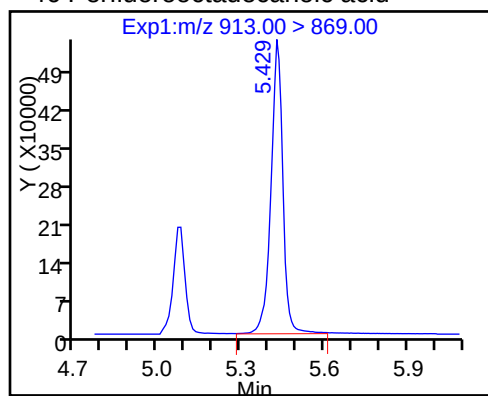
D 44 13C2-PFHxDA



45 Perfluorohexadecanoic acid



## 46 Perfluorooctadecanoic acid



## TestAmerica Sacramento

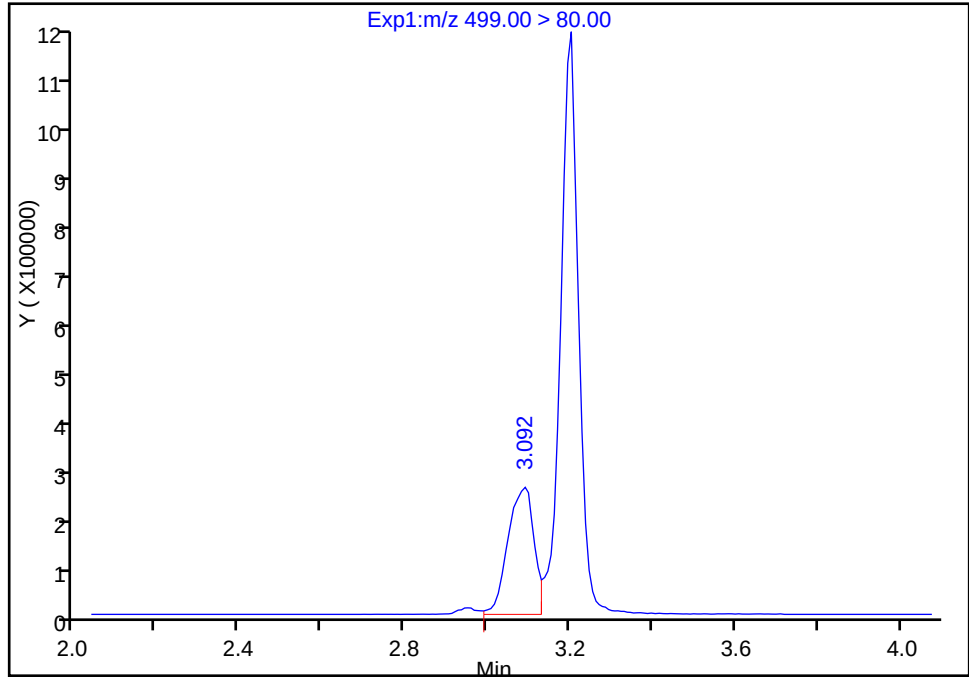
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_070.d  
Injection Date: 12-Mar-2017 04:13:07 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-C MSD  
Client ID: MEAFF-4BMW02-0317-SD  
Operator ID: A8-PC\A8 ALS Bottle#: 7 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 1

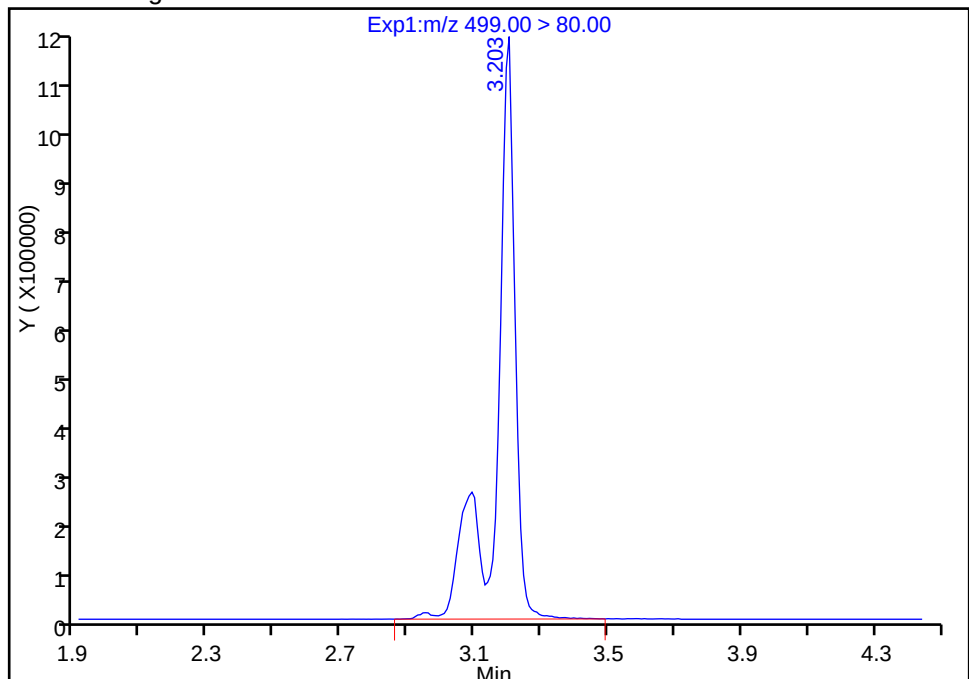
RT: 3.09  
Area: 1084238  
Amount: 5.049000  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 4588584  
Amount: 21.367781  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:19:08

Audit Action: Manually Integrated

Audit Reason: Isomers

## TestAmerica Sacramento

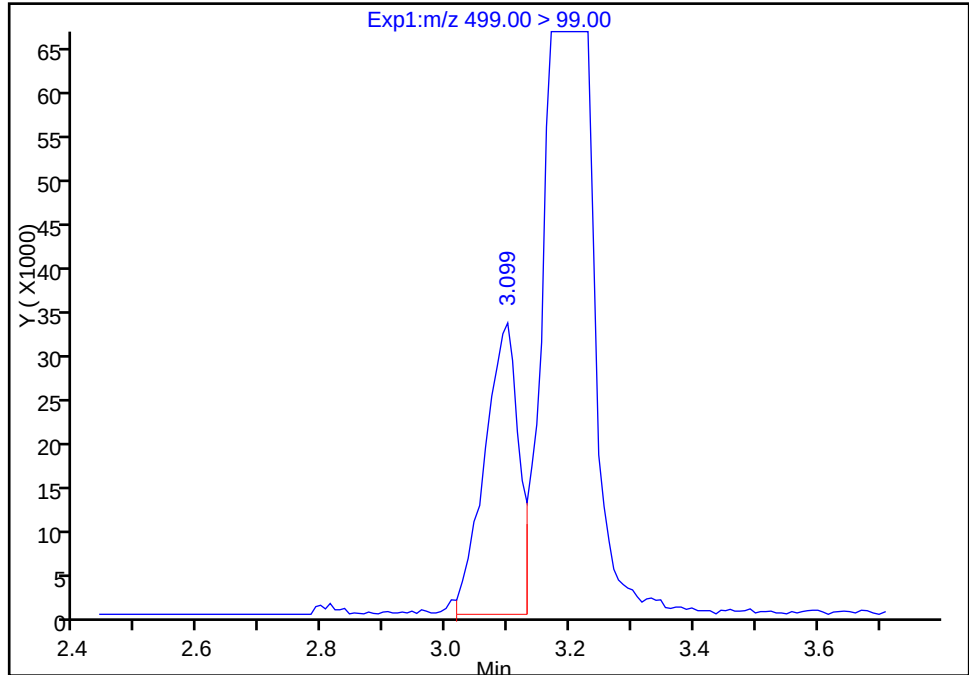
Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b\2017.03.11D\_070.d  
Injection Date: 12-Mar-2017 04:13:07 Instrument ID: A8\_N  
Lims ID: 320-26324-A-3-C MSD  
Client ID: MEAFF-4BMW02-0317-SD  
Operator ID: A8-PCVA8 ALS Bottle#: 7 Worklist Smp#: 8  
Injection Vol: 2.0 ul Dil. Factor: 1.0000  
Method: A8\_N Limit Group: LC PFC\_DOD ICAL  
Column: Detector EXP1

**17 Perfluorooctane sulfonic acid, CAS: 1763-23-1**

Signal: 2

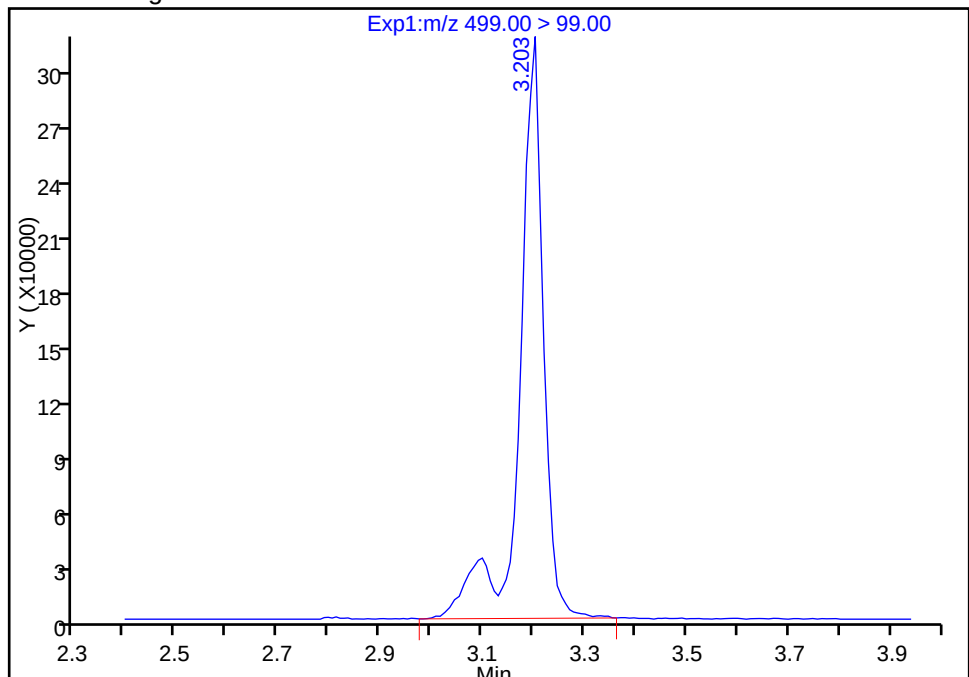
RT: 3.10  
Area: 125248  
Amount: 5.049000  
Amount Units: ng/ml

## Processing Integration Results



RT: 3.20  
Area: 1040929  
Amount: 21.367781  
Amount Units: ng/ml

## Manual Integration Results



Reviewer: changnoit, 14-Mar-2017 11:19:29

Audit Action: Manually Integrated

Audit Reason: Isomers

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Start Date: 03/01/2017 11:08Analysis Batch Number: 152681 End Date: 03/01/2017 12:31

| LAB SAMPLE ID     | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID              | COLUMN ID             |
|-------------------|------------------|------------------|--------------------|--------------------------|-----------------------|
| IC 320-152681/2   |                  | 03/01/2017 11:08 | 1                  | 2017.03.01CURVE<br>003.d | GeminiC18 3x100 3(mm) |
| IC 320-152681/3   |                  | 03/01/2017 11:16 | 1                  | 2017.03.01CURVE<br>004.d | GeminiC18 3x100 3(mm) |
| IC 320-152681/4   |                  | 03/01/2017 11:23 | 1                  | 2017.03.01CURVE<br>005.d | GeminiC18 3x100 3(mm) |
| IC 320-152681/5   |                  | 03/01/2017 11:31 | 1                  | 2017.03.01CURVE<br>006.d | GeminiC18 3x100 3(mm) |
| IC 320-152681/6   |                  | 03/01/2017 11:38 | 1                  | 2017.03.01CURVE<br>007.d | GeminiC18 3x100 3(mm) |
| IC 320-152681/7   |                  | 03/01/2017 11:46 | 1                  | 2017.03.01CURVE<br>008.d | GeminiC18 3x100 3(mm) |
| ICB 320-152681/12 |                  | 03/01/2017 12:23 | 1                  |                          | GeminiC18 3x100 3(mm) |
| ICV 320-152681/13 |                  | 03/01/2017 12:31 | 1                  | 2017.03.01CURVE<br>014.d | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-26324-1

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

Instrument ID: A8\_NStart Date: 03/11/2017 12:34Analysis Batch Number: 154503End Date: 03/11/2017 18:27

| LAB SAMPLE ID            | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID           | COLUMN ID             |
|--------------------------|------------------|------------------|--------------------|-----------------------|-----------------------|
| CCV 320-154503/1<br>CCVL |                  | 03/11/2017 12:34 | 1                  | 2017.03.11C_004<br>.d | GeminiC18 3x100 3(mm) |
| CCV 320-154503/2         |                  | 03/11/2017 12:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 12:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:20 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:27 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:35 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 13:57 | 1                  |                       | GeminiC18 3x100 3(mm) |
| CCV 320-154503/13        |                  | 03/11/2017 14:05 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:12 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:20 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:27 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:35 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 14:57 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:05 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:12 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:20 | 1                  |                       | GeminiC18 3x100 3(mm) |
| CCV 320-154503/24        |                  | 03/11/2017 15:27 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:35 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 15:57 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:05 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:12 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:20 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:27 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:35 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| CCV 320-154503/35        |                  | 03/11/2017 16:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 16:57 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:05 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:12 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:20 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:27 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:35 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:42 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:50 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 17:57 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 18:05 | 1                  |                       | GeminiC18 3x100 3(mm) |
| CCV 320-154503/46        |                  | 03/11/2017 18:12 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ                    |                  | 03/11/2017 18:20 | 1                  |                       | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Start Date: 03/11/2017 12:34Analysis Batch Number: 154503 End Date: 03/11/2017 18:27

| LAB SAMPLE ID     | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID | COLUMN ID             |
|-------------------|------------------|------------------|--------------------|-------------|-----------------------|
| CCV 320-154503/48 |                  | 03/11/2017 18:27 | 1                  |             | GeminiC18 3x100 3(mm) |

## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica SacramentoJob No.: 320-26324-1

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

Instrument ID: A8\_NStart Date: 03/12/2017 03:20Analysis Batch Number: 154520End Date: 03/12/2017 04:43

| LAB SAMPLE ID      | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID           | COLUMN ID             |
|--------------------|------------------|------------------|--------------------|-----------------------|-----------------------|
| CCV 320-154520/1   |                  | 03/12/2017 03:20 | 1                  | 2017.03.11D_063<br>.d | GeminiC18 3x100 3(mm) |
| MB 320-154076/1-A  |                  | 03/12/2017 03:28 | 1                  | 2017.03.11D_064<br>.d | GeminiC18 3x100 3(mm) |
| LCS 320-154076/2-A |                  | 03/12/2017 03:35 | 1                  | 2017.03.11D_065<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-1        |                  | 03/12/2017 03:43 | 1                  | 2017.03.11D_066<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-2        |                  | 03/12/2017 03:50 | 1                  | 2017.03.11D_067<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-3        |                  | 03/12/2017 03:58 | 1                  | 2017.03.11D_068<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-3 MS     |                  | 03/12/2017 04:05 | 1                  | 2017.03.11D_069<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-3 MSD    |                  | 03/12/2017 04:13 | 1                  | 2017.03.11D_070<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-4        |                  | 03/12/2017 04:20 | 1                  | 2017.03.11D_071<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-5        |                  | 03/12/2017 04:28 | 1                  | 2017.03.11D_072<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-6        |                  | 03/12/2017 04:35 | 1                  | 2017.03.11D_073<br>.d | GeminiC18 3x100 3(mm) |
| CCV 320-154520/12  |                  | 03/12/2017 04:43 | 1                  | 2017.03.11D_074<br>.d | GeminiC18 3x100 3(mm) |



## LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Instrument ID: A8\_N Start Date: 03/15/2017 20:08Analysis Batch Number: 155237 End Date: 03/15/2017 21:08

| LAB SAMPLE ID    | CLIENT SAMPLE ID | DATE ANALYZED    | DILUTION<br>FACTOR | LAB FILE ID           | COLUMN ID             |
|------------------|------------------|------------------|--------------------|-----------------------|-----------------------|
| CCV 320-155237/1 |                  | 03/15/2017 20:08 | 1                  | 2017.03.15D_024<br>.d | GeminiC18 3x100 3(mm) |
| 320-26324-2 DL   |                  | 03/15/2017 20:16 | 10                 | 2017.03.15D_025<br>.d | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 20:23 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 20:31 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 20:38 | 1                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 20:46 | 5                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 20:53 | 5                  |                       | GeminiC18 3x100 3(mm) |
| ZZZZZ            |                  | 03/15/2017 21:01 | 5                  |                       | GeminiC18 3x100 3(mm) |
| CCV 320-155237/9 |                  | 03/15/2017 21:08 | 1                  | 2017.03.15D_032<br>.d | GeminiC18 3x100 3(mm) |

## LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Batch Number: 154076 Batch Start Date: 03/09/17 10:13 Batch Analyst: Sharifi, NooshinBatch Method: 3535 Batch End Date: 03/10/17 12:05

| Lab Sample ID        | Client Sample ID         | Method Chain            | Basis | GrossWeight | TareWeight | InitialAmount | FinalAmount | LCMPFCSU 00053 | LCPFCSP 00080 |
|----------------------|--------------------------|-------------------------|-------|-------------|------------|---------------|-------------|----------------|---------------|
| MB 320-154076/1      |                          | 3535, 537<br>(Modified) |       |             |            | 250 mL        | 0.5 mL      | 25 uL          |               |
| LCS<br>320-154076/2  |                          | 3535, 537<br>(Modified) |       |             |            | 250 mL        | 0.5 mL      | 25 uL          | 20 uL         |
| 320-26324-A-1        | MEAFF-4DMW01-031<br>7    | 3535, 537<br>(Modified) | T     | 281.51 g    | 26.50 g    | 255 mL        | 0.5 mL      | 25 uL          |               |
| 320-26324-A-2        | MEAFF-4DMW03-031<br>7    | 3535, 537<br>(Modified) | T     | 286.66 g    | 26.55 g    | 260.1 mL      | 0.5 mL      | 25 uL          |               |
| 320-26324-A-3        | MEAFF-4BMW02-031<br>7    | 3535, 537<br>(Modified) | T     | 292.80 g    | 27.40 g    | 265.4 mL      | 0.5 mL      | 25 uL          |               |
| 320-26324-A-3<br>MS  | MEAFF-4BMW02-031<br>7-MS | 3535, 537<br>(Modified) | T     | 294.27 g    | 27.02 g    | 267.3 mL      | 0.5 mL      | 25 uL          | 20 uL         |
| 320-26324-A-3<br>MSD | MEAFF-4BMW02-031<br>7-SD | 3535, 537<br>(Modified) | T     | 294.79 g    | 26.26 g    | 268.5 mL      | 0.5 mL      | 25 uL          | 20 uL         |
| 320-26324-A-4        | MEAFF-4BMW03-031<br>7    | 3535, 537<br>(Modified) | T     | 294.39 g    | 27.53 g    | 266.9 mL      | 0.5 mL      | 25 uL          |               |
| 320-26324-A-5        | MEAFF-EB03-GW-03<br>17   | 3535, 537<br>(Modified) | T     | 291.40 g    | 26.65 g    | 264.8 mL      | 0.5 mL      | 25 uL          |               |
| 320-26324-A-6        | MEAFF-EB04-GW-03<br>17   | 3535, 537<br>(Modified) | T     | 286.58 g    | 26.26 g    | 260.3 mL      | 0.5 mL      | 25 uL          |               |

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.: 320-26324-1

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

Batch Number: 154076 Batch Start Date: 03/09/17 10:13 Batch Analyst: Sharifi, NooshinBatch Method: 3535 Batch End Date: 03/10/17 12:05

| Batch Notes                          |                 |
|--------------------------------------|-----------------|
| Balance ID                           | QA-070          |
| H2O ID                               | 3/07/17         |
| Hexane ID                            | 863965          |
| Manifold ID                          | 5               |
| Methanol ID                          | 865699          |
| Sodium Hydroxide ID                  | 858158          |
| Pipette ID                           | MD05306         |
| Analyst ID - Reagent Drop            | NSH             |
| Analyst ID - SU Reagent Drop         | NSH #1/3        |
| Analyst ID - SU Reagent Drop Witness | HJA             |
| Solvent Lot #                        | 864283          |
| Solvent Name                         | 0.3% NH4OH/MeOH |
| SOP Number                           | WS-LC-0025      |
| SPE Cartridge Type                   | WAX 500mg       |
| Solid Phase Extraction Disk ID       | 002836112A      |

| 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.

## HPLC/LCMS Data Review Checklist

Job Number(s): 220-26224

Work List ID(s): 10742

Extraction Batch: 104076

Analysis Batch(es): 151020

Delivery Rank: A

Due Date: 3/29/17

| A. Calibration/Instrument Run QC                                                                                           | 1 <sup>st</sup> Level | 2 <sup>nd</sup> Level | N/A |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----|
| 1. ICAL locked in Chrom and TALS? ICAL Batch# <u>151020</u>                                                                | ✓                     | ✓                     |     |
| 2. ICAL, CCV Frequency & Criteria met.                                                                                     | ✓                     | ✓                     |     |
| • RF <sub>average</sub> criteria appropriate for the method.                                                               | ✓                     | ✓                     |     |
| • Linear Regression criteria appropriate if required ( $r > 0.995$ ).                                                      | ✓                     | ✓                     |     |
| • Quadratic fit criteria appropriate if required ( $r^2 > 0.990$ ).                                                        |                       |                       | ✓   |
| • For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005? | ✓                     | ✓                     |     |
| • All curve points show calculated concentrations.                                                                         | ✓                     | ✓                     |     |
| 3. Peaks correctly ID'd by data system.                                                                                    | ✓                     | ✓                     |     |
| 5. Tune check frequency & criteria met and Tune check report attached.                                                     | ✓                     | ✓                     |     |
| B. QA/QC                                                                                                                   |                       |                       |     |
| 1. Are all QC samples properly linked in TALS?                                                                             | ✓                     | ✓                     |     |
| 2. Method blank, LCS/LCSD and MS/SD frequencies met.                                                                       | ✓                     | ✓                     |     |
| 3. LCS/LCSD and MB data are within control limits. If not, NCM is present.                                                 | ✓                     | ✓                     |     |
| 4. Are MS/MSD recoveries and RPD within control limits?                                                                    | ✓                     | ✓                     |     |
| 5. Holding Times were met for prep and analytical.                                                                         | ✓                     | ✓                     |     |
| 6. IS/Surrogate recoveries meet criteria or properly noted.                                                                | ✓                     | ✓                     |     |
| C. Sample Analysis                                                                                                         |                       |                       |     |
| 1. Was correct analysis performed and were project instructions followed?                                                  | ✓                     | ✓                     |     |
| 2. If required, are compounds within RT windows?                                                                           | ✓                     | ✓                     |     |
| 3. If required, are positive hits confirmed and >40% RPD flagged?                                                          |                       |                       | ✓   |
| 4. Manual Integrations reviewed and appropriate.                                                                           | ✓                     | ✓                     |     |
| 5. All analytes correctly reported. (Primary, secondary, acceptable status)                                                | ✓                     | ✓                     |     |
| 6. Correct reporting limits used. (based on client request, prep factors, and dilutions)                                   | ✓                     | ✓                     |     |
| D. Documentation                                                                                                           |                       |                       |     |
| 1. Are all non-conformances documented/attached? NCM#                                                                      | ✓                     | ✓                     |     |
| 2. Do results make sense (e.g. dilutions, etc.)?                                                                           | ✓                     | ✓                     |     |
| 3. Have all flags been reviewed for appropriateness?                                                                       | ✓                     | ✓                     |     |
| 4. For level 3 and 4 reports, have forms and raw data been reviewed?                                                       |                       | ✓                     |     |
| 5. Was QC Checker run for this job?                                                                                        | ✓                     | ✓                     |     |

\*Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.

1<sup>st</sup> Level (Analyst): Phoe. GBC 3/15/17

Date: 3/14/17

2<sup>nd</sup> Level Reviewer: MWuf

Date: 3/17/2017

mem# 79642, 80746

TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 11MAR2017E\_PFC

Worklist Number: 40742

Instrument Name: A8\_N

Chrom Method: A8\_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20170312-40742.b

QC Batching: Disabled

Limit Group Batching: Enabled

| QC Batch: 1            | LC PFC_DOD ICAL<br>Raw Batch: 154520 | LC PFC ICAL<br>Raw Batch: 154521 | LC PFAS ICAL<br>Raw Batch: 154522 | LC PFC_PREC ICAL<br>Raw Batch: 154523 |
|------------------------|--------------------------------------|----------------------------------|-----------------------------------|---------------------------------------|
| # 1 CCV L5             | # 1 CCV L5                           | # 1 CCV L5                       | # 1 CCV L5                        | # 1 CCV L5                            |
| # 2 MB 320-154076/1-A  | # 2 MB 320-154076/1-A                |                                  |                                   |                                       |
| # 3 LCS 320-154076/2-A | # 3 LCS 320-154076/2-A               |                                  |                                   |                                       |
| # 4 320-26324-A-1-A    | # 4 320-26324-A-1-A                  |                                  |                                   |                                       |
| # 5 320-26324-A-2-A    | # 5 320-26324-A-2-A                  |                                  |                                   |                                       |
| # 6 320-26324-A-3-A    | # 6 320-26324-A-3-A                  |                                  |                                   |                                       |
| # 7 320-26324-A-3-B MS | # 7 320-26324-A-3-B MS               |                                  |                                   |                                       |
| # 8 320-26324-A-3-C    | # 8 320-26324-A-3-C                  |                                  |                                   |                                       |
| MSD                    | MSD                                  |                                  |                                   |                                       |
| # 9 320-26324-A-4-A    | # 9 320-26324-A-4-A                  |                                  |                                   |                                       |
| #10 320-26324-A-5-A    | #10 320-26324-A-5-A                  |                                  |                                   |                                       |
| #11 320-26324-A-6-A    | #11 320-26324-A-6-A                  | #12 CCV L4                       | #12 CCV L4                        | #12 CCV L4                            |
| #12 CCV L4             | #12 CCV L4                           |                                  |                                   |                                       |

CCV L2 154503

1 CV 152681

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End: 3/10/17 12:25

## Solid-Phase Extraction (SPE)

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt | InitAmt<br>FinAmt | PHs  |      | Due Date | Analytical<br>TAT | Div<br>Rank | Comments      | Output Sample Lab ID |
|--------------------------------------------|----------------------|-------------------|-------------------|------|------|----------|-------------------|-------------|---------------|----------------------|
|                                            |                      |                   |                   | Rcvd | Adj1 |          |                   |             |               |                      |
| MB-320-154076/1<br>N/A                     | N/A                  |                   | 250 mL            |      |      | N/A      | N/A               | N/A         |               |                      |
|                                            |                      |                   | 0.5 mL            |      |      |          |                   |             |               |                      |
| LCS-320-154076/2<br>N/A                    | N/A                  |                   | 250 mL            |      |      | N/A      | N/A               | N/A         |               |                      |
|                                            |                      |                   | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-1<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 281.51 g          | 255 mL            |      |      | 3/10/17  | 23_Days           | 4           |               |                      |
|                                            |                      | 26.50 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-2<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 286.66 g          | 260.1 mL          |      |      | 3/10/17  | 23_Days           | 4           | 10X           |                      |
|                                            |                      | 26.55 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-3<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 292.80 g          | 265.4 mL          |      |      | 3/10/17  | 23_Days           | 4           | RA, carryover |                      |
|                                            |                      | 27.40 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-3-MS<br>(PFC_IDA_DOD5)         | N/A<br>(320-26324-1) | 294.27 g          | 267.3 mL          |      |      | 3/10/17  | 23_Days           | 4           | PA            |                      |
|                                            |                      | 27.02 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-3-MSD<br>(PFC_IDA_DOD5)        | N/A<br>(320-26324-1) | 294.79 g          | 268.5 mL          |      |      | 3/10/17  | 23_Days           | 4           | PA            |                      |
|                                            |                      | 26.26 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-4<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 294.39 g          | 266.9 mL          |      |      | 3/10/17  | 23_Days           | 4           |               |                      |
|                                            |                      | 27.53 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-5<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 291.40 g          | 264.8 mL          |      |      | 3/10/17  | 23_Days           | 4           |               |                      |
|                                            |                      | 26.65 g           | 0.5 mL            |      |      |          |                   |             |               |                      |
| 320-26324-A-6<br>(PFC_IDA_DOD5)            | N/A<br>(320-26324-1) | 286.58 g          | 260.3 mL          |      |      | 3/10/17  | 23_Days           | 4           |               |                      |
|                                            |                      | 26.26 g           | 0.5 mL            |      |      |          |                   |             |               |                      |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Open: 3/9/2017 10:13:00AM

Batch End:

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

## Batch Notes

Manifold ID 5

Methanol ID 865699

Hexane ID 863965

Sodium Hydroxide ID 858158

First Start time NA

First End time NA

SPE Cartridge Type WAX 500mg

Solid Phase Extraction Disk ID 002836112A

Balance ID QA-070

H2O ID 3/07/17

Pipette ID MD05306

Solvent Name 0.3% NH4OH/MeOH

Solvent Lot # 864283

Analyst ID - Reagent Drop NSH

Analyst ID - SU Reagent Drop NSH #1/3

Analyst ID - SU Reagent Drop

Witness

Acid Name NA

Acid ID NA

Reagent ID NA

Reagent Lot Number NA

SOP Number WS-LC-0025

Printed : 3/9/2017

Page 2 of 5

TestAmerica Sacramento

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Open: 3/9/2017 10:13:00AM

Batch End:

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Comment

## Comments

|                   |                                           |
|-------------------|-------------------------------------------|
| 320-26324-A-1     | Method Comments: DOD site, Screen-caution |
| 320-26324-A-2     | Method Comments: DOD site, Screen-caution |
| 320-26324-A-3     | Method Comments: DOD site, Screen-caution |
| 320-26324-A-3~MS  | Method Comments: DOD site, Screen-caution |
| 320-26324-A-3~MSD | Method Comments: DOD site, Screen-caution |
| 320-26324-A-4     | Method Comments: DOD site, Screen-caution |
| 320-26324-A-5     | Method Comments: DOD site, Screen-caution |
| 320-26324-A-6     | Method Comments: DOD site, Screen-caution |



# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code   | Amount Added | Final Amount | By         | Witness    |
|-------------------|----------------|--------------|--------------|------------|------------|
| MB 320-154076/1   | LCMPFCSU_00053 | 25 uL        | 0.5 mL       | NSH 3-9-17 | HSA 3-9-17 |
| LCS 320-154076/2  | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| LCS 320-154076/2  | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-1     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-2     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MS  | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MS  | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MSD | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MSD | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-4     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-5     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-6     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End:

| Reagent | Other Reagents: |       |
|---------|-----------------|-------|
|         | Amount/Units    | Lot#: |
|         |                 |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |
|         |                 |       |

Preparation Batch Number(s): 320-154076 Test: PRC-3535

Earliest Holding Time: 3/10/17

| Sample List Tab                                                                                                                                     |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|--------------------------------|
| Samples identified to the correct method                                                                                                            |  | /                              | /                              |
| All necessary NCMs filed (including holding time)                                                                                                   |  | /                              | /                              |
| Method/sample/login/QAS checked and correct                                                                                                         |  | /                              | /                              |
| Worksheet Tab                                                                                                                                       |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All samples properly preserved                                                                                                                      |  | NA                             | NA                             |
| Weights in anticipated range and not targeted                                                                                                       |  | /                              | /                              |
| All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check) |  | /                              | /                              |
| The pH is transcribed correctly in TALS                                                                                                             |  | JA                             | NA                             |
| All additional information transcribed into TALS is correct and raw data is attached                                                                |  | /                              | /                              |
| Comments are transcribed correctly in TALS                                                                                                          |  | /                              | /                              |
| Reagents Tab                                                                                                                                        |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All necessary reagents not expired and entered into TALS                                                                                            |  | /                              | /                              |
| All spike amounts correct and added to necessary samples and QC                                                                                     |  | /                              | /                              |
| Batch Information                                                                                                                                   |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| Date and time accurate and entered into TALS correctly                                                                                              |  | /                              | /                              |
| All necessary 'batch information' complete and entered into TALS correctly                                                                          |  | /                              | /                              |

1<sup>st</sup> Level Reviewer: ccz

Date: 3-10-17

2<sup>nd</sup> Level Reviewer: vpm

Date: 3/10/17

Comments: \_\_\_\_\_

## HPLC/LCMS Data Review Checklist

Job Number(s): 26324; 26264

Work List ID(s): 40907

Extraction Batch: 154076; 154208

Analysis Batch(es): 155237

Delivery Rank: 4

Due Date: 3/8/17; 3/10/17

| A. Calibration/Instrument Run QC                                                                                           | 1 <sup>st</sup> Level | 2 <sup>nd</sup> Level | N/A |
|----------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----|
| 1. ICAL locked in Chrom and TALS? ICAL Batch# <u>152621</u>                                                                | ✓                     | ✓                     |     |
| 2. ICAL, CCV Frequency & Criteria met.                                                                                     | ✓                     | ✓                     |     |
| • RF <sub>average</sub> criteria appropriate for the method.                                                               | ✓                     | ✓                     |     |
| • Linear Regression criteria appropriate if required ( $r \geq 0.995$ ).                                                   | ✓                     |                       |     |
| • Quadratic fit criteria appropriate if required ( $r^2 \geq 0.990$ ).                                                     |                       |                       | ✓   |
| • For Linear Regression and Quadratic fit – Does the y-intercept support ½ the reporting limit as described in CA-Q-S-005? | ✓                     | ✓                     |     |
| • All curve points show calculated concentrations.                                                                         | ✓                     | ✓                     |     |
| 3. Peaks correctly ID'd by data system.                                                                                    | ✓                     | ✓                     |     |
| 5. Tune check frequency & criteria met and Tune check report attached.                                                     | ✓                     | ✓                     |     |
| B. QA/QC                                                                                                                   |                       |                       |     |
| 1. Are all QC samples properly linked in TALS?                                                                             | ✓                     | ✓                     |     |
| 2. Method blank, LCS/LCSD and MS/SD frequencies met.                                                                       | ✓                     | ✓                     |     |
| 3. LCS/LCSD and MB data are within control limits. If not, NCM is present.                                                 | ✓                     | ✓                     |     |
| 4. Are MS/MSD recoveries and RPD within control limits?                                                                    | ✓                     | ✓                     |     |
| 5. Holding Times were met for prep and analytical.                                                                         | ✓                     | ✓                     |     |
| 6. IS/Surrogate recoveries meet criteria or properly noted.                                                                | ✓                     | ✓                     |     |
| C. Sample Analysis                                                                                                         |                       |                       |     |
| 1. Was correct analysis performed and were project instructions followed?                                                  | ✓                     | ✓                     |     |
| 2. If required, are compounds within RT windows?                                                                           | ✓                     | ✓                     |     |
| 3. If required, are positive hits confirmed and >40% RPD flagged?                                                          |                       |                       | ✓   |
| 4. Manual Integrations reviewed and appropriate.                                                                           | ✓                     | ✓                     |     |
| 5. All analytes correctly reported. (Primary, secondary, acceptable status)                                                | ✓                     | ✓                     |     |
| 6. Correct reporting limits used. (based on client request, prep factors, and dilutions)                                   | ✓                     | ✓                     |     |
| D. Documentation                                                                                                           |                       |                       |     |
| 1. Are all non-conformances documented/attached? NCM# <u>21144</u>                                                         | ✓                     | ✓                     |     |
| 2. Do results make sense (e.g. dilutions, etc.)?                                                                           | ✓                     | ✓                     |     |
| 3. Have all flags been reviewed for appropriateness?                                                                       | ✓                     | ✓                     |     |
| 4. For level 3 and 4 reports, have forms and raw data been reviewed?                                                       | ✓                     | ✓                     |     |
| 5. Was QC Checker run for this job?                                                                                        | ✓                     | ✓                     |     |

\*Upon completion of this checklist, the reviewer must scan and attach the checklist to the TALS job.

1<sup>st</sup> Level (Analyst): SC

Date: 3/16/17

2<sup>nd</sup> Level Reviewer: M. W. J.

Date: 3/17/2017

TestAmerica Laboratories  
Worklist QC Batch Report

Worklist Name: 15MAR2017C\_PFC

Worklist Number: 40907

Instrument Name: A8\_N

Chrom Method: A8\_N

Data Directory: \\ChromNa\Sacramento\ChromData\A8\_N\20170316-40907.b

QC Batching: Disabled

Limit Group Batching: Enabled

| QC Batch: 1                                                                                                                                                                                                         | LC PFC_DOD ICAL<br>Raw Batch: 155237                                                                                                                                                                                | LC PFC ICAL<br>Raw Batch: 155238                         | LC PFAS ICAL<br>Raw Batch: 155239                        | LC PFC_PREC ICAL<br>Raw Batch: 155240                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| # 1 CCV L5<br># 2 320-26324-A-2-A<br># 3 320-26324-A-3-A<br># 4 320-26324-A-3-B MS<br># 5 320-26324-A-3-C<br>MSD<br># 6 320-26264-A-52-B<br># 7 320-26264-A-52-E<br>MS<br># 8 320-26264-A-52-F<br>MSD<br># 9 CCV L4 | # 1 CCV L5<br># 2 320-26324-A-2-A<br># 3 320-26324-A-3-A<br># 4 320-26324-A-3-B MS<br># 5 320-26324-A-3-C<br>MSD<br># 6 320-26264-A-52-B<br># 7 320-26264-A-52-E<br>MS<br># 8 320-26264-A-52-F<br>MSD<br># 9 CCV L4 | # 1 CCV L5<br><br><br><br><br><br><br><br><br># 9 CCV L4 | # 1 CCV L5<br><br><br><br><br><br><br><br><br># 9 CCV L4 | # 1 CCV L5<br><br><br><br><br><br><br><br><br># 9 CCV L4 |

ICV 152681

CCVL 155227

RL, DL NCM 81144

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End: 3/10/17 12:25

## Solid-Phase Extraction (SPE)

Due 4/3

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)       | GrossWt<br>TareWt   | InitAmnt<br>FinAmnt | PHs  |      | Due Date | Analytical<br>TAT | Div<br>Rank | Comments      | Output Sample Lab ID |
|--------------------------------------------|----------------------|---------------------|---------------------|------|------|----------|-------------------|-------------|---------------|----------------------|
|                                            |                      |                     |                     | Rcvd | Adj1 |          |                   |             |               |                      |
| 1 MB-320-154076/1<br>N/A                   | N/A                  |                     | 250 mL<br>0.5 mL    |      |      | N/A      | N/A               | N/A         |               | MB 320-154076-1-A    |
| 2 LCS-320-154076/2<br>N/A                  | N/A                  |                     | 250 mL<br>0.5 mL    |      |      | N/A      | N/A               | N/A         |               | LCS 320-154076-2-A   |
| 3 320-26324-A-1<br>(PFC_IDA_DOD5)          | N/A<br>(320-26324-1) | 281.51 g<br>26.50 g | 255 mL<br>0.5 mL    |      |      | 3/10/17  | 23_Days           | 4           |               | 320-26324-A-1-A      |
| 4 320-26324-A-2<br>(PFC_IDA_DOD5)          | N/A<br>(320-26324-1) | 286.66 g<br>26.55 g | 260.1 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           | 10X           | 320-26324-A-2-A      |
| 5 320-26324-A-3<br>(PFC_IDA_DOD5)          | N/A<br>(320-26324-1) | 292.80 g<br>27.40 g | 265.4 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           | RA, carryover | 320-26324-A-3-A      |
| 6 320-26324-A-3-MS<br>(PFC_IDA_DOD5)       | N/A<br>(320-26324-1) | 294.27 g<br>27.02 g | 267.3 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           | PA            | 320-26324-A-3-B MS   |
| 7 320-26324-A-3-MSD<br>(PFC_IDA_DOD5)      | N/A<br>(320-26324-1) | 294.79 g<br>26.26 g | 268.5 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           | PA            | 320-26324-A-3-C MSD  |
| 8 320-26324-A-4<br>(PFC_IDA_DOD5)          | N/A<br>(320-26324-1) | 294.39 g<br>27.53 g | 266.9 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           |               | 320-26324-A-4-A      |
| 9 320-26324-A-5<br>(PFC_IDA_DOD5)          | N/A<br>(320-26324-1) | 291.40 g<br>26.65 g | 264.8 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           |               | 320-26324-A-5-A      |
| 10 320-26324-A-6<br>(PFC_IDA_DOD5)         | N/A<br>(320-26324-1) | 286.58 g<br>26.26 g | 260.3 mL<br>0.5 mL  |      |      | 3/10/17  | 23_Days           | 4           |               | 320-26324-A-6-A      |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Open: 3/9/2017 10:13:00AM

Batch End:

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

## Batch Notes

Manifold ID 5  
Methanol ID 865699  
Hexane ID 863965  
Sodium Hydroxide ID 858158  
First Start time NA  
First End time NA  
SPE Cartridge Type WAX 500mg  
Solid Phase Extraction Disk ID 002836112A  
Balance ID QA-070  
H2O ID 3/07/17  
Pipette ID MD05306  
Solvent Name 0.3% NH4OH/MeOH  
Solvent Lot # 864283  
Analyst ID - Reagent Drop NSH  
Analyst ID - SU Reagent Drop NSH #1/3  
Analyst ID - SU Reagent Drop  
Witness  
Acid Name NA  
Acid ID NA  
Reagent ID NA  
Reagent Lot Number NA  
SOP Number WS-LC-0025

Printed : 3/9/2017

Page 2 of 5

TestAmerica Sacramento

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Analyst: Sharifi, Nooshin

Batch Open: 3/9/2017 10:13:00AM

Batch End:

Batch Comment

## Comments

|                   |                  |                          |
|-------------------|------------------|--------------------------|
| 320-26324-A-1     | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-2     | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-3     | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-3-MS  | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-3-MSD | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-4     | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-5     | Method Comments: | DOD site, Screen-caution |
| 320-26324-A-6     | Method Comments: | DOD site, Screen-caution |



# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End:

## Reagent Additions Worksheet

| Lab ID            | Reagent Code   | Amount Added | Final Amount | By         | Witness    |
|-------------------|----------------|--------------|--------------|------------|------------|
| MB 320-154076/1   | LCMPFCSU_00053 | 25 uL        | 0.5 mL       | NSH 3-9-17 | NSA 3-9-17 |
| LCS 320-154076/2  | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| LCS 320-154076/2  | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-1     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-2     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MS  | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MS  | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MSD | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-3 MSD | LCPFCSU_00080  | 20 uL        | 0.5 mL       |            |            |
| 320-26324-A-4     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-5     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |
| 320-26324-A-6     | LCMPFCSU_00053 | 25 uL        | 0.5 mL       |            |            |

# Aqueous Extraction Analysis Sheet

(To Accompany Samples to Instruments)

Analyst: Sharifi, Nooshin

Batch Number: 320-154076

Method Code: 320-3535\_PFC-320

Batch Open: 3/9/2017 10:13:00AM

Batch End:

| Reagent | Other Reagents: |  | Lot#: |
|---------|-----------------|--|-------|
|         | Amount/Units    |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |
|         |                 |  |       |

Preparation Batch Number(s): 320-154076 Test: PA-3535  
Earliest Holding Time: 3/10/17

| Sample List Tab                                                                                                                                     | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------------|
| Samples identified to the correct method                                                                                                            | /                              | /                              |
| All necessary NCMs filed (including holding time)                                                                                                   | /                              | /                              |
| Method/sample/login/QAS checked and correct                                                                                                         | /                              | /                              |
| Worksheet Tab                                                                                                                                       | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All samples properly preserved                                                                                                                      | NA                             | NA                             |
| Weights in anticipated range and not targeted                                                                                                       | /                              | /                              |
| All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check) | /                              | /                              |
| The pH is transcribed correctly in TALS                                                                                                             | NA                             | NA                             |
| All additional information transcribed into TALS is correct and raw data is attached                                                                | /                              | /                              |
| Comments are transcribed correctly in TALS                                                                                                          | /                              | /                              |
| Reagents Tab                                                                                                                                        | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All necessary reagents not expired and entered into TALS                                                                                            | /                              | /                              |
| All spike amounts correct and added to necessary samples and QC                                                                                     | /                              | /                              |
| Batch Information                                                                                                                                   | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| Date and time accurate and entered into TALS correctly                                                                                              | /                              | /                              |
| All necessary 'batch information' complete and entered into TALS correctly                                                                          | /                              | /                              |

1<sup>st</sup> Level Reviewer: ccs

Date: 3-10-17

2<sup>nd</sup> Level Reviewer: vpm

Date: 3/10/17

Comments: \_\_\_\_\_

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154208

Method Code: 320-Shake\_Bath\_14D-320

Analyst: Reed, Jonathan E

Batch Open: 3/9/2017 5:06:00PM

Batch End: 3/13/17 9:55

## Shake Extraction with Ultrasonic Bath Extraction

Dil 1

| Input Sample Lab ID<br>(Analytical Method) | SDG<br>(Job #)                     | Initial<br>Amount | Final<br>Amount | Due Date | Analytical<br>TAT | Div<br>Rank | Comments | Output Sample Lab ID |
|--------------------------------------------|------------------------------------|-------------------|-----------------|----------|-------------------|-------------|----------|----------------------|
| MB-320-154208/1<br>N/A                     | N/A                                | 5.00 g            | 1.00 mL         | N/A      | N/A               | N/A         |          | MB-320-154208/1-A    |
| LCS-320-154208/2<br>N/A                    | N/A                                | 5.00 g            | 1.00 mL         | N/A      | N/A               | N/A         |          | LCS-320-154208/2-A   |
| 320-26264-A-52<br>(PFC_IDA_DOD5)           | M3010.0019.0017.0<br>(320-26264-1) | 4.97 g            | 1.00 mL         | 3/8/17   | 8_Days            | 4           | 5X       | 320-26264-A-52-B     |
| 320-26264-A-52-MS<br>(PFC_IDA_DOD5)        | M3010.0019.0017.0<br>(320-26264-1) | 4.99 g            | 1.00 mL         | 3/8/17   | 8_Days            | 4           |          | 320-26264-A-52-E     |
| 320-26264-A-52-MSD<br>(PFC_IDA_DOD5)       | M3010.0019.0017.0<br>(320-26264-1) | 5.00 g            | 1.00 mL         | 3/8/17   | 8_Days            | 4           |          | 320-26264-A-52-F     |

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154208

Method Code: 320-Shake\_Bath\_14D-320

Analyst: Reed, Jonathan E

Batch Open: 3/9/2017 5:06:00PM

Batch End:

## Batch Notes

Balance ID QA-074

Blank Sand Lot # 156690

Filter ID NA

Millipore Water Dispense Date 3/07/17

Analyst ID - Reagent Drop Witness KMK

SPE Cartridge ID 016836329B

SPE Cartridge Type WAX 150mg

Hexane ID 0000130361

Methanol ID 816942

Ammonium Hydroxide/MeOH ID 864283

Sodium Hydroxide ID 819948

Methanolic Potassium Hydroxide ID 865063

Manifold ID 56

Interference check solution ID NA

Acetic Acid ID NA

Batch Comment SU bottle: LCMPESh-00053 1/3 / LCMPESh-00014 2/5

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154208

Method Code: 320-Shake\_Bath\_14D-320

Analyst: Reed, Jonathan E

Batch Open: 3/9/2017 5:06:00PM

Batch End:

| Comments           |                                        |
|--------------------|----------------------------------------|
| 320-26264-A-52     | Method Comments: include add on spikes |
| 320-26264-A-52-MS  | Method Comments: include add on spikes |
| 320-26264-A-52-MSD | Method Comments: include add on spikes |

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154208

Method Code: 320-Shake\_Bath\_14D-320

Analyst: Reed, Jonathan E

Batch Open: 3/9/2017 5:06:00PM

Batch End:

## Reagent Additions Worksheet

| Lab ID             | Reagent Code    | Amount Added | Final Amount | By             | Witness    |
|--------------------|-----------------|--------------|--------------|----------------|------------|
| MB 320-154208/1    | LCMPFC2SU_00014 | 50 uL        | 1.00 mL      | J Reed 3/09/17 | KMK 3-9-17 |
| MB 320-154208/1    | LCMPFCSU_00053  | 50 uL        | 1.00 mL      |                |            |
| LCS 320-154208/2   | LCMPFC2SU_00014 | 50 uL        | 1.00 mL      | J Reed         |            |
| LCS 320-154208/2   | LCMPFCSU_00053  | 50 uL        | 1.00 mL      |                |            |
| LCS 320-154208/2   | LCPCFC2SP_00026 | 40 uL        | 1.00 mL      |                |            |
| LCS 320-154208/2   | LCPCFCSP_00080  | 40 uL        | 1.00 mL      |                |            |
| 320-26264-A-52     | LCMPFC2SU_00014 | 50 uL        | 1.00 mL      |                |            |
| 320-26264-A-52     | LCMPFCSU_00053  | 50 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MS  | LCMPFC2SU_00014 | 50 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MS  | LCMPFCSU_00053  | 50 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MS  | LCPCFC2SP_00026 | 40 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MS  | LCPCFCSP_00080  | 40 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MSD | LCMPFC2SU_00014 | 50 uL        | 1.00 mL      | J Reed         |            |
| 320-26264-A-52 MSD | LCMPFCSU_00053  | 50 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MSD | LCPCFC2SP_00026 | 40 uL        | 1.00 mL      |                |            |
| 320-26264-A-52 MSD | LCPCFCSP_00080  | 40 uL        | 1.00 mL      |                |            |

# Solid SW-846-3500 Analysis Sheet

(To Accompany Samples to Instruments)

Batch Number: 320-154208

Method Code: 320-Shake\_Bath\_14D-320

Analyst: Reed, Jonathan E

Batch Open: 3/9/2017 5:06:00PM

Batch End:

| Other Reagents: |              |       |
|-----------------|--------------|-------|
| Reagent         | Amount/Units | Lot#: |
|                 |              |       |
|                 |              |       |
|                 |              |       |
|                 |              |       |
|                 |              |       |
|                 |              |       |



Preparation Batch Number(s): 370-154208 Test: PFC - 14D

Earliest Holding Time: 3/12/17

| Sample List Tab                                                                                                                                     |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------|--------------------------------|
| Samples identified to the correct method                                                                                                            |  | /                              | /                              |
| All necessary NCMs filed (including holding time)                                                                                                   |  | NA                             | NA                             |
| Method/sample/login/QAS checked and correct                                                                                                         |  | /                              | /                              |
| Worksheet Tab                                                                                                                                       |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All samples properly preserved                                                                                                                      |  | NA                             | NA                             |
| Weights in anticipated range and not targeted                                                                                                       |  | /                              | /                              |
| All additional test requirements performed, documented, and uploaded to TALS correctly (e.g. final amount, initial amount, turbidity, and CI Check) |  | /                              | /                              |
| The pH is transcribed correctly in TALS                                                                                                             |  | NA                             | NA                             |
| All additional information transcribed into TALS is correct and raw data is attached                                                                |  | /                              | /                              |
| Comments are transcribed correctly in TALS                                                                                                          |  | /                              | /                              |
| Reagents Tab                                                                                                                                        |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| All necessary reagents not expired and entered into TALS                                                                                            |  | /                              | /                              |
| All spike amounts correct and added to necessary samples and QC                                                                                     |  | /                              | /                              |
| Batch Information                                                                                                                                   |  | 1 <sup>st</sup> Level Reviewer | 2 <sup>nd</sup> Level Reviewer |
| Date and time accurate and entered into TALS correctly                                                                                              |  | /                              | /                              |
| All necessary 'batch information' complete and entered into TALS correctly                                                                          |  | /                              | /                              |

1<sup>st</sup> Level Reviewer: ccf

Date: 3-13-17

2<sup>nd</sup> Level Reviewer: vpm

Date: 3/13/17

Comments: \_\_\_\_\_

Job # See below

Analyst (Print Name) Theo Phomsopha

Analyst Initials TP

Date 3/15/17

[illegible]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Shipping and Receiving Documents

West Sacramento, CA 95605-1500  
phone 916.373.5800 fax 303.467.7248

TestAmerica Laboratories, Inc.

Regulatory Program: ☐ BW ☐ NPDES ☐ RCRA ☐ Other:

| Client Contact                                                                                                                                 |                                                         | Project Manager: Bryan Burklingstock                                                    |             | Site Contact: Ryan Brown   |                              | Date: 3/3/17   |            | COC No: 7             |                      |
|------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------|----------------------------|------------------------------|----------------|------------|-----------------------|----------------------|
| Tel/Fax:                                                                                                                                       |                                                         | Analysis Turnaround Time                                                                |             | Lab Contact: Jill Kellmann |                              | Carrier: FedEx |            | 1 of 1 COCs           |                      |
|                                                                                                                                                |                                                         | <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS |             |                            |                              |                |            |                       |                      |
|                                                                                                                                                |                                                         | TAT if different from Below                                                             |             |                            |                              |                |            |                       |                      |
|                                                                                                                                                |                                                         | 2 weeks                                                                                 |             |                            |                              |                |            |                       |                      |
|                                                                                                                                                |                                                         | 1 week                                                                                  |             |                            |                              |                |            |                       |                      |
|                                                                                                                                                |                                                         | 2 days                                                                                  |             |                            |                              |                |            |                       |                      |
|                                                                                                                                                |                                                         | 1 day                                                                                   |             |                            |                              |                |            |                       |                      |
| CH2M Hill                                                                                                                                      | 6600 Peachtree Dunwoody Rd., 400 Embassy Row, Suite 600 | Sample Identification                                                                   | Sample Date | Sample Time                | Sample Type (C=Comp, G=Grab) | Matrix         | # of Cont. | Filtered Sample (Y/N) | Perform MS/MSD (Y/N) |
| Atlanta, GA 30328                                                                                                                              | (678) 530-4080 Phone                                    | MEAFF-4DHWD1-0317                                                                       | 3/3/17      | 1000                       | G                            | GL             | 2          | N                     | X                    |
| (770) 604-9183 FAX                                                                                                                             | Project Name: Meridian 10006-7-105420 JM01 Navy Clean   | MEAFF-4DHWD3-0317                                                                       |             | 1050                       |                              |                |            | X                     | X                    |
| Site: NAS Meridian                                                                                                                             | P O #: 10006-7-105420                                   | MEAFF-4DHWD2-0317                                                                       |             | 1305                       |                              |                |            | X                     | X                    |
|                                                                                                                                                |                                                         | MEAFF-4DHWD7-0317-H15                                                                   |             |                            |                              |                |            | X                     | X                    |
|                                                                                                                                                |                                                         | MEAFF-4DHWD2-0317-SD                                                                    |             |                            |                              |                |            | X                     | X                    |
|                                                                                                                                                |                                                         | MEAFF-4DHWD3-0317                                                                       |             | 1515                       |                              |                |            | X                     | X                    |
|                                                                                                                                                |                                                         | MEAFF-EP03-GW-0317                                                                      |             | 1400                       |                              |                | 4          | X                     | X                    |
|                                                                                                                                                |                                                         | MEAFF-EP04-GW-0317                                                                      |             | 1535                       |                              |                | ↓          | X                     | X                    |
| ① Time on bottle is 15:45 3/3/17                                                                                                               |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other                                                                        |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Special Instructions/QC Requirements & Comments: send results to Mike Zamboni - address should be on file                                      |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No                                                                 |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Relinquished by: Ryan Brown                                                                                                                    |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Relinquished by:                                                                                                                               |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Relinquished by:                                                                                                                               |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Custody Seal No.: CH2M Hill                                                                                                                    |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Date/Time: 3/3/17 1700                                                                                                                         |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Received by: [Signature]                                                                                                                       |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Date/Time: 3/3/17 0915                                                                                                                         |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Cooler Temp. (°F): Obs'd: 0.8                                                                                                                  |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Corr'd: 1.1                                                                                                                                    |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Therm ID No.: AK-1                                                                                                                             |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Return to Client: <input type="checkbox"/> Disposal by Lab: <input type="checkbox"/> Archive for: <input type="checkbox"/> Months              |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |
| Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)                                                            |                                                         |                                                                                         |             |                            |                              |                |            |                       |                      |



320-26324 Chain of Custody

## Login Sample Receipt Checklist

Client: CH2M Hill, Inc.

Job Number: 320-26324-1

Login Number: 26324

List Number: 1

Creator: Nelson, Kym D

List Source: TestAmerica Sacramento

| 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   |                                     |
| 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?                                              | False  |                                     |
| There are no discrepancies between the containers received and the COC.                  | False  | Refer to Job Narrative for details. |
| 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    |                                     |

















**DATA VALIDATION SUMMARY REPORT  
NAVAL AIR STATION MERIDIAN, MISSISSIPPI**

Client: CH2M HILL, Inc., Virginia Beach, Virginia  
SDG: 320-26324-1  
Laboratory: Test America Laboratories, West Sacramento, California  
Site: Naval Air Station Meridian, JM01, Meridian, Mississippi  
Date: October 28, 2017

| PFCs   |                      |                      |        |
|--------|----------------------|----------------------|--------|
| EDS ID | Client Sample ID     | Laboratory Sample ID | Matrix |
| 1*     | MEAFF-4DMW01-0317    | 320-26324-1          | Water  |
| 2*     | MEAFF-4DMW03-0317    | 320-26324-2          | Water  |
| 2DL*   | MEAFF-4DMW03-0317DL  | 320-26324-2DL        | Water  |
| 3*     | MEAFF-4BMW02-0317    | 320-26324-3          | Water  |
| 3MS*   | MEAFF-4BMW02-0317MS  | 320-26324-3MS        | Water  |
| 3MSD*  | MEAFF-4BMW02-0317MSD | 320-26324-3MSD       | Water  |
| 4*     | MEAFF-4BMW03-0317    | 320-26324-4          | Water  |
| 5      | MEAFF-EB03-GW-0317   | 320-26324-5          | Water  |
| 6      | MEAFF-EB04-GW-0317   | 320-26324-6          | Water  |

\* - PFCs only

A full data validation was performed on the analytical data for four water samples and two aqueous equipment blank samples collected on March 3, 2017 by CH2M HILL at the NAS Meridian site in Mississippi. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)" and the Test America Laboratories (TAL) Standard Operating Procedure for the analysis of 1,4-dioxane by GC/MS-SIM.

Specific method references are as follows:

Analysis

PFCs  
SVOC-SIM (1,4-Dioxane)

Method References

USEPA Method 537 Modified  
TAL SOP WS-MS-0011

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods, the Draft Sampling and Analysis Plan, Perfluorinated Compounds Site Inspection, Naval Air Station Meridian, Task Order JM01, August 2016, and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- USEPA Region 4 "Data Validation Standard Operating Procedures for CLP Organic Data using GC/MS and GC/ECD", Rev. 0.0, February 2016;

- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

### ***Organics***

- Holding times and sample preservation
- Liquid/Gas Chromatography/Mass Spectrometry (LC/GC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

### **Data Usability Assessment**

There were no rejections of data.

Overall the data is acceptable for the intended purposes. There were no qualifications.

### **Perfluorinated Compounds (PFCs)**

#### **Holding Times**

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

#### **LC/MS Tuning**

- All criteria were met.

#### **Initial Calibration**

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

### Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

### Method Blank

- The method blanks were free of contamination.

### Field QC Blank

- The field QC sample results are summarized below.

| Blank ID           | Compound  | Conc.<br>ng/L | Qualifier | Affected Samples |
|--------------------|-----------|---------------|-----------|------------------|
| MEAFF-EB03-GW-0317 | None - ND | -             | -         | -                |
| MEAFF-EB04-GW-0317 | None - ND | -             | -         | -                |

### Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate %R values.

### Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

### Laboratory Control Sample (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R) values.

### Target Compound Identification

- All mass spectra and quantitation criteria were met.

### Compound Quantitation

- Several samples results were flagged (M) by the laboratory indicating manual integration. These flags were removed by the reviewer.
- EDS Sample ID 2 was flagged (E) by the laboratory for PFOS exceeding the linear range of the instrument. The sample was diluted and reanalyzed and the dilution result for PFOS should be used for reporting purposes.

### Field Duplicate Sample Precision

- Field duplicate samples were not collected.



## Semivolatile Organic Compounds (1,4-Dioxane)

### Holding Times

- All samples were extracted within 7 days for water samples and analyzed within 40 days.

### GC/MS Tuning

- All criteria were met.

### Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

### Continuing Calibration

- The continuing calibrations exhibited acceptable %D and RRF criteria.

### Method Blank

- The method blanks were free of contamination.

### Field Blank

- The field blank results are summarized below.

| Blank ID           | Compound  | Conc.<br>ug/L | Qualifier | Affected Samples |
|--------------------|-----------|---------------|-----------|------------------|
| MEAFF-EB03-GW-0317 | None - ND | -             | -         | -                |
| MEAFF-EB04-GW-0317 | None - ND | -             | -         | -                |

### Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

### Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- MS/MSD samples were not analyzed.

### Laboratory Control Samples/Laboratory Control Sample Duplicate (LCS/LCSD)

- The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

### Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

### Target Compound Identification

- All mass spectra and quantitation criteria were met.

### Compound Quantitation

- All criteria were met.

### Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

  
Nancy Weaver  
Senior Chemist

Dated: 11/2/17

| <b>Data Qualifier</b> | <b>Definition</b>                                                                                                                                                |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U                     | The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.                                                    |
| J                     | The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.                              |
| NJ                    | The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.   |
| UJ                    | The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.                            |
| R                     | The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples. |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4DMW01-0317 Lab Sample ID: 320-26324-1  
 Matrix: Water Lab File ID: 2017.03.11D\_066.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 10:00  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 255(mL) Date Analyzed: 03/12/2017 03:43  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q            | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|--------------|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 220    | <del>1</del> | 2.5 | 2.0 | 0.73 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 210    | <del>1</del> | 3.9 | 2.9 | 1.3  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 11     |              | 2.5 | 2.0 | 0.90 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 67   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 91   |   | 25-150 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

2

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4DMW03-0317 Lab Sample ID: 320-26324-2  
 Matrix: Water Lab File ID: 2017.03.11D\_067.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 10:50  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 260.1(mL) Date Analyzed: 03/12/2017 03:50  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q                   | LOQ | LOD            | DL   |
|-----------|-------------------------------------|--------|---------------------|-----|----------------|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 360    | <del>M</del>        | 2.4 | 1.9            | 0.72 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 1100   | <del>1100 M E</del> | 38  | <del>3.8</del> | 29   |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 15     | <del>X</del>        | 2.4 | 1.9            | 0.88 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 69   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 76   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 83   |   | 25-150 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

20L

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4DMW03-0317 DL Lab Sample ID: 320-26324-2 DL  
 Matrix: Water Lab File ID: 2017.03.15D 025.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 10:50  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 260.1(mL) Date Analyzed: 03/15/2017 20:16  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 10  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 155237 Units: ng/L

use  
original  
result

| CAS NO.   | COMPOUND NAME                       | RESULT | Q               | LOQ | LOD | DL  |
|-----------|-------------------------------------|--------|-----------------|-----|-----|-----|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 390    | <del>DM</del>   | 24  | 19  | 7.2 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 1100   | <del>DM</del>   | 38  | 29  | 12  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 16     | <del>J DM</del> | 24  | 19  | 8.8 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 93   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 100  |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 113  |   | 25-150 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

3

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW02-0317 Lab Sample ID: 320-26324-3  
 Matrix: Water Lab File ID: 2017.03.11D\_068.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 13:05  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 265.4 (mL) Date Analyzed: 03/12/2017 03:58  
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1  
 Injection Volume: 2 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q              | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|----------------|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U <del>M</del> | 2.4 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U <del>M</del> | 3.8 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U              | 2.4 | 1.9 | 0.86 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 38   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 93   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 102  |   | 25-150 |



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-4BMW03-0317 Lab Sample ID: 320-26324-4  
 Matrix: Water Lab File ID: 2017.03.11D\_071.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 15:15  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 266.9(mL) Date Analyzed: 03/12/2017 04:20  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.3 | 1.9 | 0.70 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U | 3.7 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 4.3    |   | 2.3 | 1.9 | 0.86 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 37   |   | 25-150 |
| STL00991 | 13C4 PFOS        | 89   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 97   |   | 25-150 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB03-GW-0317 Lab Sample ID: 320-26324-5  
 Matrix: Water Lab File ID: 2017.03.11D\_072.d  
 Analysis Method: 537 (Modified) Date Collected: 03/03/2017 14:00  
 Extraction Method: 3535 Date Extracted: 03/09/2017 10:15  
 Sample wt/vol: 264.8(mL) Date Analyzed: 03/12/2017 04:28  
 Con. Extract Vol.: 0.5(mL) Dilution Factor: 1  
 Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.4 | 1.9 | 0.71 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.8    | U | 3.8 | 2.8 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U | 2.4 | 1.9 | 0.87 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 106  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 99   |   | 25-150 |

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1

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

Client Sample ID: MEAFF-EB04-GW-0317 Lab Sample ID: 320-26324-6

Matrix: Water Lab File ID: 2017.03.11D\_073.d

Analysis Method: 537 (Modified) Date Collected: 03/03/2017 15:35

Extraction Method: 3535 Date Extracted: 03/09/2017 10:15

Sample wt/vol: 260.3(mL) Date Analyzed: 03/12/2017 04:35

Con. Extract Vol.: 0.5(mL) Dilution Factor: 1

Injection Volume: 2(uL) GC Column: GeminiC18 3x100 ID: 3(mm)

% Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N

Analysis Batch No.: 154520 Units: ng/L

| CAS NO.   | COMPOUND NAME                       | RESULT | Q | LOQ | LOD | DL   |
|-----------|-------------------------------------|--------|---|-----|-----|------|
| 335-67-1  | Perfluorooctanoic acid (PFOA)       | 1.9    | U | 2.4 | 1.9 | 0.72 |
| 1763-23-1 | Perfluorooctanesulfonic acid (PFOS) | 2.9    | U | 3.8 | 2.9 | 1.2  |
| 375-73-5  | Perfluorobutanesulfonic acid (PFBS) | 1.9    | U | 2.4 | 1.9 | 0.88 |

| CAS NO.  | ISOTOPE DILUTION | %REC | Q | LIMITS |
|----------|------------------|------|---|--------|
| STL00990 | 13C4 PFOA        | 101  |   | 25-150 |
| STL00991 | 13C4 PFOS        | 90   |   | 25-150 |
| STL00994 | 18O2 PFHxS       | 95   |   | 25-150 |



FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

5

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB03-GW-0317 Lab Sample ID: 320-26324-5  
 Matrix: Water Lab File ID: S031425.D  
 Analysis Method: WS-MS-0011 Date Collected: 03/03/2017 14:00  
 Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
 Sample wt/vol: 883.4(mL) Date Analyzed: 03/15/2017 00:04  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 1(uL) Level: (low/med) Low  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 0.57   | U | 1.1 | 0.57 | 0.23 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 76   |   | 42-91  |

FORM I  
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

6

Lab Name: TestAmerica Sacramento Job No.: 320-26324-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: MEAFF-EB04-GW-0317 Lab Sample ID: 320-26324-6  
 Matrix: Water Lab File ID: S031426.D  
 Analysis Method: WS-MS-0011 Date Collected: 03/03/2017 15:35  
 Extract. Method: 3510C Date Extracted: 03/08/2017 08:41  
 Sample wt/vol: 933.6(mL) Date Analyzed: 03/15/2017 00:27  
 Con. Extract Vol.: 1.0(mL) Dilution Factor: 1  
 Injection Volume: 1(uL) Level: (low/med) Low  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 154875 Units: ug/L

| CAS NO.  | COMPOUND NAME | RESULT | Q | LOQ | LOD  | DL   |
|----------|---------------|--------|---|-----|------|------|
| 123-91-1 | 1,4-Dioxane   | 0.54   | U | 1.1 | 0.54 | 0.21 |

| CAS NO.   | SURROGATE       | %REC | Q | LIMITS |
|-----------|-----------------|------|---|--------|
| 4165-60-0 | Nitrobenzene-d5 | 74   |   | 42-91  |

new 10/28/17