

ANALYTICAL REPORT

Job Number: 280-86952-1

Job Description: ADEM PFC Sampling

For:

Alabama Dept. Environmental Management
2715 Sandlin Road, SW
Decatur, AL 35603
Attention: Mr. Ed Poolos



Approved for release.
Stephanie K Rothmeyer
Project Manager I
9/9/2016 11:09 AM

Stephanie K Rothmeyer, Project Manager I
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0182
stephanie.rothmeyer@testamericainc.com
09/09/2016

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

TestAmerica Laboratories, Inc.

TestAmerica Denver 4955 Yarrow Street, Arvada, CO 80002

Tel (303) 736-0100 Fax (303) 431-7171 www.testamericainc.com

Definitions/Glossary

Client: Alabama Dept. Environmental Management
Project/Site: ADEM PFC Sampling

TestAmerica Job ID: 280-86952-1

Qualifiers

LCMS

| Qualifier | Qualifier Description |
|-----------|--|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

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: Alabama Dept. Environmental Management

Project: ADEM PFC Sampling

Report Number: 280-86952-1

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.

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.

RECEIPT

The samples were received on 8/17/2016 at 7:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

PERFLUORINATED HYDROCARBONS (PFC)

Samples GADSDEN- RAW (280-86952-1) and GADSDEN- FINISHED (280-86952-2) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with SOP DV-LC-0012. The samples were prepared on 08/25/2016 and 08/29/2016 and analyzed on 09/01/2016 and 09/02/2016.

The following sample was decanted prior to preparation: GADSDEN- RAW (280-86952-1). Solvent rinse on the original container was not able to be performed.

The continuing calibration verification (CCV) associated with batch 280-339905 recovered above the upper control limit for Perfluorotetradecanoic acid and Perfluorotridecanoic acid. The samples associated with this CCV were non-detect for the affected analytes; therefore, the data have been reported.

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

PERFLUOROOCANE SULFONAMIDE (FOSA)

Samples GADSDEN- RAW (280-86952-1) and GADSDEN- FINISHED (280-86952-2) were analyzed for Perfluorooctane Sulfonamide (FOSA) in accordance with SOP DV-LC-0012. The samples were prepared on 08/29/2016 and 08/30/2016 and analyzed on 08/31/2016.

The following sample was decanted prior to preparation: GADSDEN- RAW (280-86952-1). Solvent rinse on the original container was not able to be performed.

No FOSA IS spike was added to the LCS/LCSD in batch 280-340311. No sample was available to re-extract sample GADSDEN- RAW (280-86952-1). Sample IS is in control.

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

Client Sample Results

Client: Alabama Dept. Environmental Management
Project/Site: ADEM PFC Sampling

TestAmerica Job ID: 280-86952-1

Client Sample ID: GADSDEN- RAW

Lab Sample ID: 280-86952-1

Date Collected: 08/15/16 22:40

Matrix: Water

Date Received: 08/17/16 07:30

Method: DV-LC-0012 - Perfluorinated Hydrocarbons

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|-------------------------------------|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| Perfluorobutane Sulfonate (PFBS) | 0.071 | | 0.020 | 0.0082 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorobutanoic acid (PFBA) | 0.016 | J | 0.020 | 0.0098 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorodecane sulfonate (PFDS) | 0.0091 | U | 0.020 | 0.0091 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorodecanoic acid (PFDA) | 0.0078 | U | 0.020 | 0.0078 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorododecanoic acid (PFDoA) | 0.015 | U | 0.030 | 0.015 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 0.018 | J | 0.030 | 0.013 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorohexane Sulfonate (PFHxS) | 0.0069 | U | 0.030 | 0.0069 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorohexanoic acid (PFHxA) | 0.045 | | 0.020 | 0.0029 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorononanoic acid (PFNA) | 0.017 | U | 0.040 | 0.017 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorooctanoic acid (PFOA) | 0.031 | | 0.020 | 0.0097 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorooctane Sulfonate (PFOS) | 0.041 | | 0.030 | 0.013 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluoropentanoic acid (PFPA) | 0.059 | | 0.030 | 0.011 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorotetradecanoic acid (PFTeA) | 0.015 | U | 0.030 | 0.015 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluorotridecanoic Acid (PFTriA) | 0.018 | U | 0.040 | 0.018 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Perfluoroundecanoic acid (PFUnA) | 0.0069 | U | 0.020 | 0.0069 | ug/L | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C8 PFOA | 128 | | 60 - 155 | | | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |
| 13C8 PFOS | 98 | | 45 - 130 | | | | 08/25/16 20:40 | 09/01/16 14:49 | 1 |

Method: PFC -FOSA - FOSA in Water (LC/MS/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------------|--------|-----------|-------|--------|------|---|----------------|----------------|---------|
| Perfluorooctane Sulfonamide (FOSA) | 0.0057 | U | 0.050 | 0.0057 | ug/L | | 08/29/16 19:53 | 08/31/16 18:10 | 1 |

Client Sample ID: GADSDEN- FINISHED

Lab Sample ID: 280-86952-2

Date Collected: 08/16/16 11:00

Matrix: Water

Date Received: 08/17/16 07:30

Method: DV-LC-0012 - Perfluorinated Hydrocarbons

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|-------------------------------------|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| Perfluorobutane Sulfonate (PFBS) | 0.059 | | 0.020 | 0.0081 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorobutanoic acid (PFBA) | 0.017 | J | 0.020 | 0.0096 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorodecane sulfonate (PFDS) | 0.0089 | U | 0.020 | 0.0089 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorodecanoic acid (PFDA) | 0.0076 | U | 0.020 | 0.0076 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorododecanoic acid (PFDoA) | 0.015 | U | 0.029 | 0.015 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluoroheptanoic acid (PFHpA) | 0.014 | J | 0.029 | 0.013 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorohexane Sulfonate (PFHxS) | 0.0068 | U | 0.029 | 0.0068 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorohexanoic acid (PFHxA) | 0.043 | | 0.020 | 0.0028 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorononanoic acid (PFNA) | 0.017 | U | 0.039 | 0.017 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorooctanoic acid (PFOA) | 0.031 | | 0.020 | 0.0096 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorooctane Sulfonate (PFOS) | 0.042 | | 0.029 | 0.013 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluoropentanoic acid (PFPA) | 0.061 | | 0.029 | 0.011 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorotetradecanoic acid (PFTeA) | 0.014 | U | 0.029 | 0.014 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluorotridecanoic Acid (PFTriA) | 0.017 | U | 0.039 | 0.017 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Perfluoroundecanoic acid (PFUnA) | 0.0067 | U | 0.020 | 0.0067 | ug/L | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 13C8 PFOA | 125 | | 60 - 155 | | | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |
| 13C8 PFOS | 112 | | 45 - 130 | | | | 08/29/16 19:57 | 09/02/16 06:25 | 1 |

Client Sample Results

Client: Alabama Dept. Environmental Management
Project/Site: ADEM PFC Sampling

TestAmerica Job ID: 280-86952-1

Client Sample ID: GADSDEN- FINISHED

Lab Sample ID: 280-86952-2

Date Collected: 08/16/16 11:00

Matrix: Water

Date Received: 08/17/16 07:30

Method: PFC -FOSA - FOSA in Water (LC/MS/MS)

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------------|--------|-----------|-------|--------|------|---|----------------|----------------|---------|
| Perfluorooctane Sulfonamide (FOSA) | 0.0055 | U | 0.048 | 0.0055 | ug/L | | 08/30/16 20:25 | 08/31/16 21:14 | 1 |