

## ANALYTICAL REPORT

Job Number: 280-126392-1

Job Description: ADEM PFC Sampling - Gadsden

For:

Alabama Dept. Environmental Management  
2715 Sandlin Road, SW  
Decatur, AL 35603

Attention: Mr. Bruce Freeman



Approved for release.  
DiLea R Bindel  
Project Manager I  
7/25/2019 4:00 PM

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07/25/2019

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.

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## Definitions/Glossary

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

Job ID: 280-126392-1

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### Qualifiers

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#### LCMS

| Qualifier | Qualifier Description  |
|-----------|--|
| I         | Value is EMPC (estimated maximum possible concentration).  |
| J         | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U         | Indicates the analyte was analyzed for but not detected.   |

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### Glossary

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

## CASE NARRATIVE

**Client: Alabama Dept. Environmental Management**

**Project: ADEM PFC Sampling - Gadsden**

**Report Number: 280-126392-1**

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 7/18/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

### **PERFLUORINATED HYDROCARBONS (PFC)**

Samples GADSDEN-RAW (280-126392-1) and GADSDEN-FINISHED (280-126392-2) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with SOP DV-LC-0012. The samples were prepared on 07/20/2019 and analyzed on 07/22/2019.

Compound Perfluorobutanoic acid eluted outside the retention time window on the column for the following samples: GADSDEN-RAW (280-126392-1), GADSDEN-FINISHED (280-126392-2), (CCV 280-465248/17), (CCV 280-465248/28), (CCV 280-465248/39), (LCS 280-465164/2-A), (MB 280-465164/1-A). This retention time shift was taken into account when reviewing the sample(s) for target compounds.

Samples are flagged for ion ratio failure. It is in the analyst judgment that the detections are real and are reported with the appropriate flags. GADSDEN-RAW (280-126392-1), GADSDEN-FINISHED (280-126392-2), (CCV 280-465248/17), (CCV 280-465248/28), (CCV 280-465248/39), (LCS 280-465164/2-A), (MB 280-465164/1-A).

Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: GADSDEN-RAW (280-126392-1) and (MB 280-465164/1-A). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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

## Detection Summary

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

Job ID: 280-126392-1

### Client Sample ID: GADSDEN-RAW

### Lab Sample ID: 280-126392-1

| Analyte                             | Result | Qualifier | RL    | MDL    | Unit | Dil Fac | D | Method     | Prep Type |
|-------------------------------------|--------|-----------|-------|--------|------|---------|---|------------|-----------|
| Perfluorohexanoic acid (PFHxA)      | 0.025  | I         | 0.016 | 0.0065 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorooctanoic acid (PFOA)       | 0.022  | I         | 0.016 | 0.0081 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorooctane sulfonate (PFOS)    | 0.037  | I         | 0.025 | 0.011  | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluoropentanoic acid (PFPA)      | 0.036  |           | 0.025 | 0.0090 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) | 0.078  | I         | 0.016 | 0.0068 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |

### Client Sample ID: GADSDEN-FINISHED

### Lab Sample ID: 280-126392-2

| Analyte                             | Result | Qualifier | RL    | MDL    | Unit | Dil Fac | D | Method     | Prep Type |
|-------------------------------------|--------|-----------|-------|--------|------|---------|---|------------|-----------|
| Perfluorobutanoic acid (PFBA)       | 0.010  | J         | 0.017 | 0.0086 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorohexanoic acid (PFHxA)      | 0.013  | J I       | 0.017 | 0.0069 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorooctane sulfonate (PFOS)    | 0.020  | J I       | 0.026 | 0.012  | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluoropentanoic acid (PFPA)      | 0.023  | J         | 0.026 | 0.0095 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |
| Perfluorobutanesulfonic acid (PFBS) | 0.045  | I         | 0.017 | 0.0072 | ug/L | 1       |   | DV-LC-0012 | Total/NA  |

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Denver

## Client Sample Results

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

Job ID: 280-126392-1

**Client Sample ID: GADSDEN-RAW**

**Lab Sample ID: 280-126392-1**

Date Collected: 07/15/19 19:11

Matrix: Water

Date Received: 07/18/19 09:00

**Method: DV-LC-0012 - Fluorinated Alkyl Substances**

| Analyte                                    | Result           | Qualifier        | RL            | MDL    | Unit | D | Prepared        | Analyzed        | Dil Fac        |
|--|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| Perfluorobutanoic acid (PFBA)              | 0.0081           | U                | 0.016         | 0.0081 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorodecanoic acid (PFDA)              | 0.0064           | U                | 0.016         | 0.0064 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorododecanoic acid (PFDoA)           | 0.012            | U                | 0.025         | 0.012  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluoroheptanoic acid (PFHpA)            | 0.011            | U                | 0.025         | 0.011  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Perfluorohexanoic acid (PFHxA)</b>      | <b>0.025</b>     | <b>I</b>         | 0.016         | 0.0065 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorononanoic acid (PFNA)              | 0.0062           | U                | 0.033         | 0.0062 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Perfluorooctanoic acid (PFOA)</b>       | <b>0.022</b>     | <b>I</b>         | 0.016         | 0.0081 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Perfluorooctane sulfonate (PFOS)</b>    | <b>0.037</b>     | <b>I</b>         | 0.025         | 0.011  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Perfluoropentanoic acid (PFPA)</b>      | <b>0.036</b>     |                  | 0.025         | 0.0090 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorotetradecanoic acid (PFTeA)        | 0.012            | U                | 0.025         | 0.012  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorotridecanoic acid (PFTriA)         | 0.015            | U                | 0.033         | 0.015  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluoroundecanoic acid (PFUnA)           | 0.0057           | U                | 0.016         | 0.0057 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Perfluorobutanesulfonic acid (PFBS)</b> | <b>0.078</b>     | <b>I</b>         | 0.016         | 0.0068 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorodecanesulfonic acid (PFDS)        | 0.0075           | U                | 0.016         | 0.0075 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| Perfluorohexanesulfonic acid (PFHxS)       | 0.0057           | U                | 0.025         | 0.0057 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| <b>Surrogate</b>                           | <b>%Recovery</b> | <b>Qualifier</b> | <b>Limits</b> |        |      |   | <b>Prepared</b> | <b>Analyzed</b> | <b>Dil Fac</b> |
| 13C8 PFOA                                  | 89               |                  | 60 - 155      |        |      |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |
| 13C8 PFOS                                  | 89               |                  | 45 - 130      |        |      |   | 07/20/19 15:14  | 07/22/19 14:07  | 1              |

**Client Sample ID: GADSDEN-FINISHED**

**Lab Sample ID: 280-126392-2**

Date Collected: 07/16/19 10:45

Matrix: Water

Date Received: 07/18/19 09:00

**Method: DV-LC-0012 - Fluorinated Alkyl Substances**

| Analyte                                    | Result           | Qualifier        | RL            | MDL    | Unit | D | Prepared        | Analyzed        | Dil Fac        |
|--|------------------|------------------|---------------|--------|------|---|-----------------|-----------------|----------------|
| <b>Perfluorobutanoic acid (PFBA)</b>       | <b>0.010</b>     | <b>J</b>         | 0.017         | 0.0086 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorodecanoic acid (PFDA)              | 0.0068           | U                | 0.017         | 0.0068 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorododecanoic acid (PFDoA)           | 0.013            | U                | 0.026         | 0.013  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluoroheptanoic acid (PFHpA)            | 0.012            | U                | 0.026         | 0.012  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| <b>Perfluorohexanoic acid (PFHxA)</b>      | <b>0.013</b>     | <b>J I</b>       | 0.017         | 0.0069 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorononanoic acid (PFNA)              | 0.0066           | U                | 0.035         | 0.0066 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorooctanoic acid (PFOA)              | 0.0086           | U                | 0.017         | 0.0086 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| <b>Perfluorooctane sulfonate (PFOS)</b>    | <b>0.020</b>     | <b>J I</b>       | 0.026         | 0.012  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| <b>Perfluoropentanoic acid (PFPA)</b>      | <b>0.023</b>     | <b>J</b>         | 0.026         | 0.0095 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorotetradecanoic acid (PFTeA)        | 0.013            | U                | 0.026         | 0.013  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorotridecanoic acid (PFTriA)         | 0.015            | U                | 0.035         | 0.015  | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluoroundecanoic acid (PFUnA)           | 0.0060           | U                | 0.017         | 0.0060 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| <b>Perfluorobutanesulfonic acid (PFBS)</b> | <b>0.045</b>     | <b>I</b>         | 0.017         | 0.0072 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorodecanesulfonic acid (PFDS)        | 0.0080           | U                | 0.017         | 0.0080 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| Perfluorohexanesulfonic acid (PFHxS)       | 0.0061           | U                | 0.026         | 0.0061 | ug/L |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| <b>Surrogate</b>                           | <b>%Recovery</b> | <b>Qualifier</b> | <b>Limits</b> |        |      |   | <b>Prepared</b> | <b>Analyzed</b> | <b>Dil Fac</b> |
| 13C8 PFOA                                  | 90               |                  | 60 - 155      |        |      |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |
| 13C8 PFOS                                  | 91               |                  | 45 - 130      |        |      |   | 07/20/19 15:14  | 07/22/19 14:20  | 1              |

## Default Detection Limits

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

Job ID: 280-126392-1

### Method: DV-LC-0012 - Fluorinated Alkyl Substances

Prep: 3535

| Analyte                              | RL    | MDL    | Units |
|--------------------------------------|-------|--------|-------|
| Perfluorobutanesulfonic acid (PFBS)  | 0.020 | 0.0082 | ug/L  |
| Perfluorobutanoic acid (PFBA)        | 0.020 | 0.0098 | ug/L  |
| Perfluorodecanesulfonic acid (PFDS)  | 0.020 | 0.0092 | ug/L  |
| Perfluorodecanoic acid (PFDA)        | 0.020 | 0.0078 | ug/L  |
| Perfluorododecanoic acid (PFDoA)     | 0.030 | 0.015  | ug/L  |
| Perfluoroheptanoic acid (PFHpA)      | 0.030 | 0.013  | ug/L  |
| Perfluorohexanesulfonic acid (PFHxS) | 0.030 | 0.0070 | ug/L  |
| Perfluorohexanoic acid (PFHxA)       | 0.020 | 0.0079 | ug/L  |
| Perfluorononanoic acid (PFNA)        | 0.040 | 0.0075 | ug/L  |
| Perfluorooctane sulfonate (PFOS)     | 0.030 | 0.013  | ug/L  |
| Perfluorooctanoic acid (PFOA)        | 0.020 | 0.0098 | ug/L  |
| Perfluoropentanoic acid (PFPA)       | 0.030 | 0.011  | ug/L  |
| Perfluorotetradecanoic acid (PFTeA)  | 0.030 | 0.015  | ug/L  |
| Perfluorotridecanoic acid (PFTriA)   | 0.040 | 0.018  | ug/L  |
| Perfluoroundecanoic acid (PFUnA)     | 0.020 | 0.0069 | ug/L  |