



**Off-Base Drinking Water Sample Results,  
Electronic Data Deliverable, Data Validation Report,  
and the Sample Location Figure, SDG 320-44517-1**

*Naval Air Station Willow Grove  
Willow Grove, Pennsylvania*

August 2019

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "24", "ng/L", "", "0.88", "DL", "", "TRG", "", "", "4.6", "LOQ", "YES", "-99", "", "270.9", "10.00", "1.8", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "24", "ng/L", "M", "2.5", "DL", "", "TRG", "", "", "6.5", "LOQ", "YES", "-99", "", "270.9", "10.00", "5.5", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "15", "ng/L", "", "0.59", "DL", "", "TRG", "", "", "4.6", "LOQ", "YES", "-99", "", "270.9", "10.00", "1.8", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "18", "ng/L", "", "0.74", "DL", "", "TRG", "", "", "4.6", "LOQ", "YES", "-99", "", "270.9", "10.00", "1.8", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "6.7", "ng/L", "M", "1.2", "DL", "", "TRG", "", "", "4.6", "LOQ", "YES", "-99", "", "270.9", "10.00", "2.8", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "2.4", "ng/L", "J M", "0.43", "DL", "", "TRG", "", "", "4.6", "LOQ", "YES", "-99", "", "270.9", "10.00", "0.92", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "STL00993", "13C2 PFHxA", "93", "ng/L", "", "-99", "DL", "", "SURR", "101", "", "-99", "LOQ", "YES", "92.3", "", "270.9", "10.00", "0", ""

"WGNA-102418-RW-0437", "537", "RES", "320-44517-1", "TALSAC", "STL00996", "13C2 PFDA", "91", "ng/L", "", "-99", "DL", "", "SURR", "99", "", "-99", "LOQ", "YES", "92.3", "", "270.9", "10.00", "0", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "1.7", "ng/L", "U", "0.82", "DL", "", "TRG", "", "", "4.3", "LOQ", "YES", "-99", "", "290", "10.00", "1.7", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "5.2", "ng/L", "U M", "2.3", "DL", "", "TRG", "", "", "6.0", "LOQ", "YES", "-99", "", "290", "10.00", "5.2", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "1.7", "ng/L", "U", "0.55", "DL", "", "TRG", "", "", "4.3", "LOQ", "YES", "-99", "", "290", "10.00", "1.7", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "1.7", "ng/L", "U", "0.69", "DL", "", "TRG", "", "", "4.3", "LOQ", "YES", "-99", "", "290", "10.00", "1.7", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "2.6", "ng/L", "U", "1.1", "DL", "", "TRG", "", "", "4.3", "LOQ", "YES", "-99", "", "290", "10.00", "2.6", ""

"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "0.86", "ng/L", "U", "0.41", "DL", "", "TRG", "", "", "4.3", "LOQ", "YES", "-99", "", "290", "10.00", "0.86", ""

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"WGNA-102418-FRB-0437", "537", "RES", "320-44517-2", "TALSAC", "STL00996", "13C2 PFDA", "80", "ng/L", "", "-99", "DL", "", "SURR", "93", "", "-99", "LOQ", "YES", "86.2", "", "290", "10.00", "0", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "12", "ng/L", "", "0.79", "DL", "", "TRG", "", "", "4.2", "LOQ", "YES", "-99", "", "300.2", "10.00", "1.7", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "13", "ng/L", "M", "2.2", "DL", "", "TRG", "", "", "5.8", "LOQ", "YES", "-99", "", "300.2", "10.00", "5.0", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid (PFHxS)", "6.5", "ng/L", "", "0.53", "DL", "", "TRG", "", "", "4.2", "LOQ", "YES", "-99", "", "300.2", "10.00", "1.7", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "375-73-5", "Perfluorobutanesulfonic acid (PFBS)", "7.4", "ng/L", "", "0.67", "DL", "", "TRG", "", "", "4.2", "LOQ", "YES", "-99", "", "300.2", "10.00", "1.7", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "375-85-9", "Perfluoroheptanoic acid (PFHpA)", "3.8", "ng/L", "J", "1.1", "DL", "", "TRG", "", "", "4.2", "LOQ", "YES", "-99", "", "300.2", "10.00", "2.5", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "375-95-1", "Perfluorononanoic acid (PFNA)", "1.8", "ng/L", "J M", "0.39", "DL", "", "TRG", "", "", "4.2", "LOQ", "YES", "-99", "", "300.2", "10.00", "0.83", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "STL00993", "13C2 PFHxA", "81", "ng/L", "", "-99", "DL", "", "SURR", "97", "", "-99", "LOQ", "YES", "83.3", "", "300.2", "10.00", "0", ""

"WGNA-102418-RW-3142", "537", "RES", "320-44517-3", "TALSAC", "STL00996", "13C2 PFDA", "77", "ng/L", "", "-99", "DL", "", "SURR", "92", "", "-99", "LOQ", "YES", "83.3", "", "300.2", "10.00", "0", ""

"WGNA-102418-FRB-3142", "537", "RES", "320-44517-4", "TALSAC", "1763-23-1", "Perfluorooctanesulfonic acid (PFOS)", "1.7", "ng/L", "U", "0.83", "DL", "", "TRG", "", "", "4.4", "LOQ", "YES", "-99", "", "286.3", "10.00", "1.7", ""

"WGNA-102418-FRB-3142", "537", "RES", "320-44517-4", "TALSAC", "335-67-1", "Perfluorooctanoic acid (PFOA)", "5.2", "ng/L", "U", "2.4", "DL", "", "TRG", "", "", "6.1", "LOQ", "YES", "-99", "", "286.3", "10.00", "5.2", ""

"WGNA-102418-FRB-3142", "537", "RES", "320-44517-4", "TALSAC", "355-46-4", "Perfluorohexanesulfonic acid

(PFHxS),"1.7","ng/L","U","0.56","DL","","TRG","","","4.4","LOQ","YES",-99","","286.3","10.00","1.7","","WGNA-102418-FRB-3142","537","RES","320-44517-4","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS),"1.7","ng/L","U","0.70","DL","","TRG","","","4.4","LOQ","YES",-99","","286.3","10.00","1.7","","WGNA-102418-FRB-3142","537","RES","320-44517-4","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA),"2.6","ng/L","U","1.1","DL","","TRG","","","4.4","LOQ","YES",-99","","286.3","10.00","2.6","","WGNA-102418-FRB-3142","537","RES","320-44517-4","TALSAC","375-95-1","Perfluorononanoic acid (PFNA),"0.87","ng/L","U","0.41","DL","","TRG","","","4.4","LOQ","YES",-99","","286.3","10.00","0.87","","WGNA-102418-FRB-3142","537","RES","320-44517-4","TALSAC","STL00993","13C2 PFHxA","86","ng/L","","-99","DL","","SURR","98","","-99","LOQ","YES","87.3","","286.3","10.00","0","","WGNA-102418-FRB-3142","537","RES","320-44517-4","TALSAC","STL00996","13C2 PFDA","82","ng/L","","-99","DL","","SURR","94","","-99","LOQ","YES","87.3","","286.3","10.00","0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS),"3.32","ng/L","J","0.95","DL","","SPK","89","","5.0","LOQ","YES","3.71","","250","10.00","2.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA),"3.59","ng/L","J M","2.7","DL","","SPK","90","","7.0","LOQ","YES","4.00","","250","10.00","6.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS),"3.50","ng/L","J","0.64","DL","","SPK","96","","5.0","LOQ","YES","3.64","","250","10.00","2.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS),"3.15","ng/L","J","0.80","DL","","SPK","89","","5.0","LOQ","YES","3.54","","250","10.00","2.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA),"3.62","ng/L","J","1.3","DL","","SPK","90","","5.0","LOQ","YES","4.00","","250","10.00","3.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA),"3.74","ng/L","J","0.47","DL","","SPK","94","","5.0","LOQ","YES","4.00","","250","10.00","1.0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","STL00993","13C2 PFHxA","94.6","ng/L","","-99","DL","","SURR","95","","-99","LOQ","YES","100","","250","10.00","0","","LLCS 320-257580/2-A","537","RES","LLCS 320-257580/2-A","TALSAC","STL00996","13C2 PFDA","91.0","ng/L","","-99","DL","","SURR","91","","-99","LOQ","YES","100","","250","10.00","0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS),"3.38","ng/L","J","0.95","DL","","SPK","91","2","5.0","LOQ","YES","3.71","LLCS 320-257580/2-A","250","10.00","2.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","335-67-1","Perfluorooctanoic acid (PFOA),"3.98","ng/L","J","2.7","DL","","SPK","99","10","7.0","LOQ","YES","4.00","LLCS 320-257580/2-A","250","10.00","6.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid (PFHxS),"3.38","ng/L","J","0.64","DL","","SPK","93","3","5.0","LOQ","YES","3.64","LLCS 320-257580/2-A","250","10.00","2.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid (PFBS),"3.51","ng/L","J","0.80","DL","","SPK","99","11","5.0","LOQ","YES","3.54","LLCS 320-257580/2-A","250","10.00","2.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","375-85-9","Perfluoroheptanoic acid (PFHpA),"3.56","ng/L","J","1.3","DL","","SPK","89","1","5.0","LOQ","YES","4.00","LLCS 320-257580/2-A","250","10.00","3.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","375-95-1","Perfluorononanoic acid (PFNA),"3.82","ng/L","J","0.47","DL","","SPK","96","2","5.0","LOQ","YES","4.00","LLCS 320-257580/2-A","250","10.00","1.0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","STL00993","13C2 PFHxA","104","ng/L","","-99","DL","","SURR","104","9","-99","LOQ","YES","100","LLCS 320-257580/2-A","250","10.00","0","","LLCSD 320-257580/3-A","537","RES","LLCSD 320-257580/3-A","TALSAC","STL00996","13C2 PFDA","98.5","ng/L","","-99","DL","","SURR","99","8","-99","LOQ","YES","100","LLCS 320-257580/2-A","250","10.00","0","","MB 320-257580/1-A","537","RES","MB 320-257580/1-A","TALSAC","1763-23-1","Perfluorooctanesulfonic acid (PFOS),"2.0","ng/L","U","0.95","DL","","TRG","","","5.0","LOQ","YES",-99","","250","10.00","2.0","","MB 320-257580/1-A","537","RES","MB 320-257580/1-A","TALSAC","335-67-1","Perfluorooctanoic acid

(PFOA),"6.0","ng/L","U","2.7","DL","","","TRG","","","7.0","LOQ","YES","-99","","","250","10.00","6.0","","  
"MB 320-257580/1-A","537","RES","MB 320-257580/1-A","TALSAC","355-46-4","Perfluorohexanesulfonic acid  
(PFHxS),"2.0","ng/L","U","0.64","DL","","","TRG","","","5.0","LOQ","YES","-99","","","250","10.00","2.0","","  
"MB 320-257580/1-A","537","RES","MB 320-257580/1-A","TALSAC","375-73-5","Perfluorobutanesulfonic acid  
(PFBS),"2.0","ng/L","U","0.80","DL","","","TRG","","","5.0","LOQ","YES","-99","","","250","10.00","2.0","","  
"MB 320-257580/1-A","537","RES","MB 320-257580/1-A","TALSAC","375-85-9","Perfluoroheptanoic acid  
(PFHpA),"3.0","ng/L","U","1.3","DL","","","TRG","","","5.0","LOQ","YES","-99","","","250","10.00","3.0","","  
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PFHxA),"87.0","ng/L","","","-99","DL","","","SURR","87","","","-99","LOQ","YES","100","","","250","10.00","0","","  
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PFDA),"82.4","ng/L","","","-99","DL","","","SURR","82","","","-99","LOQ","YES","100","","","250","10.00","0","","  
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2","FB","","","5.80","537","METHOD","RES","11/07/2018 10:40","11/10/2018  
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257875","320-44517-1","10/25/2018 09:25","11/12/2018 12:48","","  
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257875","320-44517-1","11/07/2018 10:40","11/12/2018 12:48","","  
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257875","320-44517-1","11/07/2018 10:40","11/12/2018 12:48","","



**TETRA TECH**

**INTERNAL CORRESPONDENCE**

**TO:                   A. FREBOWITZ                                   DATE:            DECEMBER 20, 2018**

**FROM:              TERRI L. SOLOMON                             COPIES:        DV FILE**

**SUBJECT:          ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**  
**NAS JRB WILLOW GROVE**  
**SAMPLE DELIVERY GROUP (SDG) 320-44517-1**

**SAMPLES:**    2/Field Reagent Blank (FRB)  
                    WGNA-102418-FRB-0437    WGNA-102418-FRB-3142

                    2/Drinking Water  
                    WGNA-102418-RW-0437    WGNA-102418-RW-3142

**Overview**

The sample set for NAS JRB Willow Grove, SDG 320-44517-1, consisted of two (2) drinking water samples and two (2) FRB samples. All samples were analyzed for select perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA) and perfluorooctane sulfonic acid (PFOS). No field duplicate pairs were included in this SDG.

The samples were collected by Tetra Tech on October 24, 2018 and analyzed by Test America-Sacramento. All sample analyses were conducted in accordance with EPA Method 537 version 1.1 analytical and reporting protocols.

The data contained in this SDG was validated with regard to the following parameters: data completeness, holding times, mass calibration, mass spectral acquisition rate, instrument sensitivity check, initial/continuing calibrations, ion transitions, laboratory method/FRB results, surrogate spike recoveries, low level laboratory control sample / low level laboratory control sample duplicate results, injected internal standard areas and recoveries, chromatographic resolution, analyte identification, analyte quantitation, and detection limits. Areas of concern are listed below.

**Major**

None.

**Minor**

None.

**Notes**

The low level continuing calibration percent differences (%Ds) on 11/10/2018 at 03:37 on instrument A8\_N were above the quality control limit for PFHxS and PFOS. No validation actions were required as no samples were affected.

Samples with detections and their associated FRBs are summarized below. No detected results were present in the FRBs.

<u>Sample</u>	<u>Associated FRB</u>
WGNA-102418-RW-0437	WGNA-102418-FRB-0437
WGNA-102418-RW-3142	WGNA-102418-FRB-3142

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Non-detected results were reported to the Limit of Detection (LOD).

The buffering agent Trizma was added to all drinking water samples.

**Executive Summary**

**Laboratory Performance:** No issues.

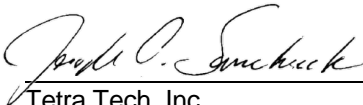
**Other Factors Affecting Data Quality:** Results below the RL were estimated.

The data for these analyses were reviewed with reference to the Environmental Protection Agency document EPA/600/R-08/092, Method 537, "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)", (September 2009), US EPA National Functional Guidelines for Organic Data Review (January 2017), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (July 2013) as applicable. The text of this report has been formulated to address only those areas affecting data quality.



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Tetra Tech, Inc.  
Terri L. Solomon  
Chemist/Data Validator



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Tetra Tech, Inc.  
Joseph A. Samchuck  
Data Validation Manager

**Attachments:**

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

### Data Qualifier Definitions

The following definitions provide brief explanations of the validation qualifiers assigned to results in the data review process.

<b>U</b>	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
<b>J</b>	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
<b>J+</b>	The result is an estimated quantity, but the result may be biased high.
<b>J-</b>	The result is an estimated quantity, but the result may be biased low.
<b>UJ</b>	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
<b>NJ</b>	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
<b>R</b>	The sample result (detected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
<b>UR</b>	The sample result (nondetected) is unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.
<b>X</b>	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team, but exclusion of the data is recommended.

**Appendix A**

Qualified Analytical Results



**Qualifier Codes:**

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = ICP PDS Recovery Noncompliance; MSA's  $r < 0.995$
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (i.e., base-time drifting)
- P = Uncertainty near detection limit ( $< 2 \times$  IDL for inorganics and  $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = RPD between columns/detectors  $>40\%$  for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient  $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids  $<30\%$
- Z = Uncertainty at 2 standard deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed
- Z3 = Tentatively Identified Compound aldol condensate
- Z4 = Sample activity is less than the at uncertainty at 3 standard deviations and greater than the MDC
- Z5 = Sample activity is less than the at uncertainty at 3 standard deviations and less than the MDC

<b>PROJ_NO: 08005-WE04</b> <b>SDG: 320-44517-1</b> <b>FRACTION: PFAS</b> <b>MEDIA: WATER</b>	NSAMPLE	WGNA-102418-FRB-0437			WGNA-102418-FRB-3142			WGNA-102418-RW-0437			WGNA-102418-RW-3142		
	LAB_ID	320-44517-2			320-44517-4			320-44517-1			320-44517-3		
	SAMP_DATE	10/24/2018			10/24/2018			10/24/2018			10/24/2018		
	QC_TYPE	FB			FB			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	5.2	U		5.2	U		24			13			
PERFLUOROBUTANESULFONIC ACID (PFBS)	1.7	U		1.7	U		18			7.4			
PERFLUOROHEPTANOIC ACID (PFHPA)	2.6	U		2.6	U		6.7			3.8	J	P	
PERFLUOROHEXANESULFONIC ACID (PFHXS)	1.7	U		1.7	U		15			6.5			
PERFLUORONONANOIC ACID (PFNA)	0.86	U		0.87	U		2.4	J	P	1.8	J	P	
PERFLUOROOCTANESULFONIC ACID (PFOS)	1.7	U		1.7	U		24			12			

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-RW-0437 Lab Sample ID: 320-44517-1  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_033.d  
 Analysis Method: 537 Date Collected: 10/24/2018 08:10  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 270.9(mL) Date Analyzed: 11/08/2018 15:49  
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24		4.6	1.8	0.88
335-67-1	Perfluorooctanoic acid (PFOA)	24	<del>M</del>	6.5	5.5	2.5
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J <del>M</del>	4.6	0.92	0.43
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		4.6	1.8	0.59
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.7	<del>M</del>	4.6	2.8	1.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	18		4.6	1.8	0.74

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	99		70-130

*Wesley L. Selman*  
12/20/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-FRB-0437 Lab Sample ID: 320-44517-2  
 Matrix: Water Lab File ID: 2018.11.09\_537A\_012.d  
 Analysis Method: 537 Date Collected: 10/24/2018 08:05  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 290 (mL) Date Analyzed: 11/10/2018 04:36  
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 258311 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	4.3	1.7	0.82
335-67-1	Perfluorooctanoic acid (PFOA)	5.2	U <del>M</del>	6.0	5.2	2.3
375-95-1	Perfluorononanoic acid (PFNA)	0.86	U	4.3	0.86	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	U	4.3	1.7	0.55
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	U	4.3	2.6	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	U	4.3	1.7	0.69

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	93		70-130

*Ali L. Salmen*  
12/20/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-RW-3142 Lab Sample ID: 320-44517-3  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_035.d  
 Analysis Method: 537 Date Collected: 10/24/2018 13:10  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 300.2 (mL) Date Analyzed: 11/08/2018 16:04  
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12		4.2	1.7	0.79
335-67-1	Perfluorooctanoic acid (PFOA)	13	<del>M</del>	5.8	5.0	2.2
375-95-1	Perfluorononanoic acid (PFNA)	1.8	J <del>M</del>	4.2	0.83	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5		4.2	1.7	0.53
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	J	4.2	2.5	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.4		4.2	1.7	0.67

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	92		70-130

*Steve L. Salmeron*  
12/20/2018

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-FRB-3142 Lab Sample ID: 320-44517-4  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_036.d  
 Analysis Method: 537 Date Collected: 10/24/2018 13:05  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 286.3(mL) Date Analyzed: 11/08/2018 16:11  
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	4.4	1.7	0.83
335-67-1	Perfluorooctanoic acid (PFOA)	5.2	U	6.1	5.2	2.4
375-95-1	Perfluorononanoic acid (PFNA)	0.87	U	4.4	0.87	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	U	4.4	1.7	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	U	4.4	2.6	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	U	4.4	1.7	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	94		70-130

*Wesley L. Salzman*  
12/20/2018

**Appendix B**

Results as Reported by the Laboratory

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-RW-0437 Lab Sample ID: 320-44517-1  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_033.d  
 Analysis Method: 537 Date Collected: 10/24/2018 08:10  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 270.9(mL) Date Analyzed: 11/08/2018 15:49  
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	24		4.6	1.8	0.88
335-67-1	Perfluorooctanoic acid (PFOA)	24	M	6.5	5.5	2.5
375-95-1	Perfluorononanoic acid (PFNA)	2.4	J M	4.6	0.92	0.43
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	15		4.6	1.8	0.59
375-85-9	Perfluoroheptanoic acid (PFHpA)	6.7	M	4.6	2.8	1.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	18		4.6	1.8	0.74

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	101		70-130
STL00996	13C2 PFDA	99		70-130



FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-FRB-0437 Lab Sample ID: 320-44517-2  
 Matrix: Water Lab File ID: 2018.11.09\_537A\_012.d  
 Analysis Method: 537 Date Collected: 10/24/2018 08:05  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 290 (mL) Date Analyzed: 11/10/2018 04:36  
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 258311 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	4.3	1.7	0.82
335-67-1	Perfluorooctanoic acid (PFOA)	5.2	U M	6.0	5.2	2.3
375-95-1	Perfluorononanoic acid (PFNA)	0.86	U	4.3	0.86	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	U	4.3	1.7	0.55
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	U	4.3	2.6	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	U	4.3	1.7	0.69

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	92		70-130
STL00996	13C2 PFDA	93		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-RW-3142 Lab Sample ID: 320-44517-3  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_035.d  
 Analysis Method: 537 Date Collected: 10/24/2018 13:10  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 300.2 (mL) Date Analyzed: 11/08/2018 16:04  
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	12		4.2	1.7	0.79
335-67-1	Perfluorooctanoic acid (PFOA)	13	M	5.8	5.0	2.2
375-95-1	Perfluorononanoic acid (PFNA)	1.8	J M	4.2	0.83	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	6.5		4.2	1.7	0.53
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.8	J	4.2	2.5	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	7.4		4.2	1.7	0.67

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	97		70-130
STL00996	13C2 PFDA	92		70-130

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: WGNA-102418-FRB-3142 Lab Sample ID: 320-44517-4  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_036.d  
 Analysis Method: 537 Date Collected: 10/24/2018 13:05  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 286.3(mL) Date Analyzed: 11/08/2018 16:11  
 Con. Extract Vol.: 10.00(mL) Dilution Factor: 1  
 Injection Volume: 10(uL) GC Column: GeminiC18 3x100 ID: 3(mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	1.7	U	4.4	1.7	0.83
335-67-1	Perfluorooctanoic acid (PFOA)	5.2	U	6.1	5.2	2.4
375-95-1	Perfluorononanoic acid (PFNA)	0.87	U	4.4	0.87	0.41
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	1.7	U	4.4	1.7	0.56
375-85-9	Perfluoroheptanoic acid (PFHpA)	2.6	U	4.4	2.6	1.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	1.7	U	4.4	1.7	0.70

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	98		70-130
STL00996	13C2 PFDA	94		70-130

**Appendix C**

Support Documentation

**TestAmerica Sacramento**  
 880 Riverside Parkway  
 West Sacramento, CA 95605-1500  
 phone 916.373.5600 fax 303.467.7248

**Chain of Custody Record**

**TestAmerica**  
 THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program:  DW  NPDES  RCRA  Other:

<b>Client Contact</b>	<b>Project Manager:</b> Andy Frebowitz	<b>Site Contact:</b> Mary Kay Bond	<b>Date:</b> 10/24/2018	<b>COC No.:</b>
TetraTech	<b>Tel/Fax:</b> 610.382.2920	<b>Lab Contact:</b> Dave Alltucker	<b>Carrier:</b> FedEx	1 of 1 COCs
234 Mall Boulevard Suite 260	<b>Analysis Turnaround Time</b>			<b>Sampler:</b> Mary Kay Bond
King of Prussia, PA 19406	<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS			<b>For Lab Use Only:</b>
610-382-2924	TAT if different from Below 21			Walk-in Client:
610-491-9688	<input checked="" type="checkbox"/> 2 weeks			Lab Sampling:
Project Name: WE04	<input type="checkbox"/> 1 week			
Site: WE04	<input type="checkbox"/> 2 days			
P O # 1132358 (through EarthToxics)	<input type="checkbox"/> 1 day			Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	EPA 537 UCMR3	Sample Specific Notes:
WGNA-102418-RW-0437	10/24/2018	08:10	G	DW	2	N	N	Y	
WGNA-102418-FRB-0437	10/24/2018	08:05	G	DW	2	N	N	Y	Field Reagent Blank
WGNA-102418-RW-3142	10/24/2018	13:10	G	DW	2	N	N	Y	
WGNA-102418-FRB-3142	10/24/2018	13:05	G	DW	2	N	N	Y	Field Reagent Blank



320-44517 Chain of Custody

<b>Preservation Used:</b> 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other: Trizma	6
<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.	<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>
<input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown	<input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months

Fed Ex Tracking: 7735 4166 1213

Custody Seals Intact:  Yes  No

Custody Seal No.: \_\_\_\_\_ Cooler Temp. (°C): Obs'd: 5.8 Corr'd: 5.8 Therm ID No.: AK3

Relinquished by: <i>[Signature]</i>	Company: Tetra Tech	Date/Time: 10/24/2018 16:00	Received by: <i>[Signature]</i>	Company: TH Sac	Date/Time: 10/25/18 9:25
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Form No. CA-C-WI-002, Rev. 4.11, dated 1/24/2017

Page 321 of 322

**Job Narrative**  
**320-44517-1**

**Receipt**

The samples were received on 10/25/2018 9:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.8° C.

**LCMS**

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

Method(s) 537: The low level continuing calibration verification (CCVL) associated with batch 320-258157 recovered above the upper control limit for Perfluorooctanesulfonic acid (PFOS) and Perfluorohexanesulfonic acid (PFHxS). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: 320-44517-2.

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

**Organic Prep**

Method(s) 537: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-257580.

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

# Definitions/Glossary

Client: Tetra Tech, Inc.  
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-44517-1

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## Qualifiers

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### LCMS

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

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## Glossary

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

# Method Summary

Client: Tetra Tech, Inc.  
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-44517-1

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<b>Method</b>	<b>Method Description</b>	<b>Protocol</b>	<b>Laboratory</b>
537	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

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



# Sample Summary

Client: Tetra Tech, Inc.  
Project/Site: Warminster: PFAS, NAS JRB Willow Grove

TestAmerica Job ID: 320-44517-1

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<b>Lab Sample ID</b>	<b>Client Sample ID</b>	<b>Matrix</b>	<b>Collected</b>	<b>Received</b>
320-44517-1	WGNA-102418-RW-0437	Water	10/24/18 08:10	10/25/18 09:25
320-44517-2	WGNA-102418-FRB-0437	Water	10/24/18 08:05	10/25/18 09:25
320-44517-3	WGNA-102418-RW-3142	Water	10/24/18 13:10	10/25/18 09:25
320-44517-4	WGNA-102418-FRB-3142	Water	10/24/18 13:05	10/25/18 09:25

FORM II  
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Sacramento

Job No.: 320-44517-1

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

Matrix: Water

Level: Low

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

Client Sample ID	Lab Sample ID	PFHxA #	PFDA #
WGNA-102418-RW-043 7	320-44517-1	101	99
WGNA-102418-FRB-04 37	320-44517-2	92	93
WGNA-102418-RW-314 2	320-44517-3	97	92
WGNA-102418-FRB-31 42	320-44517-4	98	94
	MB 320-257580/1-A	87	82
	LLCS 320-257580/2-A	95	91
	LLCSD 320-257580/3-A	104	99

PFHxA = 13C2 PFHxA  
PFDA = 13C2 PFDA

QC LIMITS  
70-130  
70-130

# Column to be used to flag recovery values

FORM III  
LCMS LOW LEVEL CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Matrix: Water Level: Low Lab File ID: 2018.11.08\_537AA\_031.d

Lab ID: LLCS 320-257580/2-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCS CONCENTRATION (ng/L)	LLCS % REC	QC LIMITS REC	#
Perfluorooctanesulfonic acid (PFOS)	3.71	3.32 J	89	50-150	
Perfluorooctanoic acid (PFOA)	4.00	3.59 J	90	50-150	M
Perfluorononanoic acid (PFNA)	4.00	3.74 J	94	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.64	3.50 J	96	50-150	
Perfluoroheptanoic acid (PFHpA)	4.00	3.62 J	90	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.54	3.15 J	89	50-150	

# Column to be used to flag recovery and RPD values

FORM III  
LCMS LOW LEVEL CONTROL STANDARD DUPLICATE RECOVERY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Matrix: Water Level: Low Lab File ID: 2018.11.08\_537AA\_032.d  
 Lab ID: LLCSD 320-257580/3-A Client ID: \_\_\_\_\_

COMPOUND	SPIKE ADDED (ng/L)	LLCSD CONCENTRATION (ng/L)	LLCSD		QC LIMITS		#
			% REC	% RPD	RPD	REC	
Perfluorooctanesulfonic acid (PFOS)	3.71	3.38 J	91	2	50	50-150	
Perfluorooctanoic acid (PFOA)	4.00	3.98 J	99	10	50	50-150	
Perfluorononanoic acid (PFNA)	4.00	3.82 J	96	2	50	50-150	
Perfluorohexanesulfonic acid (PFHxS)	3.64	3.38 J	93	3	50	50-150	
Perfluoroheptanoic acid (PFHpA)	4.00	3.56 J	89	1	50	50-150	
Perfluorobutanesulfonic acid (PFBS)	3.54	3.51 J	99	11	50	50-150	

# Column to be used to flag recovery and RPD values

FORM IV  
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab File ID: 2018.11.08\_537AA\_030.d Lab Sample ID: MB 320-257580/1-A  
 Matrix: Water Date Extracted: 11/07/2018 10:40  
 Instrument ID: A8\_N Date Analyzed: 11/08/2018 15:27  
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LLCS 320-257580/2-A	2018.11.08_537AA_031.d	11/08/2018 15:35
	LLCSD 320-257580/3-A	2018.11.08_537AA_032.d	11/08/2018 15:42
WGNA-102418-RW-0437	320-44517-1	2018.11.08_537AA_033.d	11/08/2018 15:49
WGNA-102418-RW-3142	320-44517-3	2018.11.08_537AA_035.d	11/08/2018 16:04
WGNA-102418-FRB-3142	320-44517-4	2018.11.08_537AA_036.d	11/08/2018 16:11
WGNA-102418-FRB-0437	320-44517-2	2018.11.09_537A_012.d	11/10/2018 04:36

FORM I  
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Client Sample ID: \_\_\_\_\_ Lab Sample ID: MB 320-257580/1-A  
 Matrix: Water Lab File ID: 2018.11.08\_537AA\_030.d  
 Analysis Method: 537 Date Collected: \_\_\_\_\_  
 Extraction Method: 537 Date Extracted: 11/07/2018 10:40  
 Sample wt/vol: 250 (mL) Date Analyzed: 11/08/2018 15:27  
 Con. Extract Vol.: 10.00 (mL) Dilution Factor: 1  
 Injection Volume: 10 (uL) GC Column: GeminiC18 3x100 ID: 3 (mm)  
 % Moisture: \_\_\_\_\_ GPC Cleanup: (Y/N) N  
 Analysis Batch No.: 257875 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.0	U	5.0	2.0	0.95
335-67-1	Perfluorooctanoic acid (PFOA)	6.0	U	7.0	6.0	2.7
375-95-1	Perfluorononanoic acid (PFNA)	1.0	U	5.0	1.0	0.47
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.0	U	5.0	2.0	0.64
375-85-9	Perfluoroheptanoic acid (PFHpA)	3.0	U	5.0	3.0	1.3
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.0	U	5.0	2.0	0.80

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL00993	13C2 PFHxA	87		70-130
STL00996	13C2 PFDA	82		70-130

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Instrument ID: A8\_N Calibration Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3(mm) Calibration End Date: 10/25/2018 15:43  
 Calibration ID: 41909

	13PFOA		PFOS			
	AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT	954978	2.58	794812	2.98		
UPPER LIMIT	1432467	3.08	1192218	3.48		
LOWER LIMIT	477489	2.08	397406	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID					
CCVL 320-254941/10	971947	2.58	820552	2.98		
ICV 320-254941/12	974787	2.58	788400	2.98		
CCVL 320-257836/1	914756	2.61	699877	2.99		
CCV 320-257875/24 CCVIS	801193	2.59	590850	2.99		
MB 320-257580/1-A	974125	2.59	717756	2.99		
LLCS 320-257580/2-A	1049766	2.59	794682	2.99		
LLCSD 320-257580/3-A	1041506	2.59	777080	2.98		
320-44517-1	WGNA-102418-RW-0437	1075122	2.59	809646	2.98	
320-44517-3	WGNA-102418-RW-3142	1056272	2.61	766847	2.99	
320-44517-4	WGNA-102418-FRB-3142	1073241	2.60	793184	2.98	
CCV 320-257875/35 CCVIS	858756	2.59	671592	2.99		
CCV 320-258311/7 CCVIS	942078	2.58	691642	2.98		
320-44517-2	WGNA-102418-FRB-0437	1008361	2.58	698156	2.98	
CCV 320-258311/10 CCVIS	873615	2.58	672895	2.96		

13PFOA = 13C2 PFOA  
 PFOS = 13C4 PFOS

Area Limit = 50%-150% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-257875/24 Date Analyzed: 11/08/2018 15:12  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.11.08\_537AA\_02 Heated Purge: (Y/N) N  
 Calibration ID: 41909

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	801193	2.59	590850	2.99		
UPPER LIMIT	1121670	3.09	827190	3.49		
LOWER LIMIT	560835	2.09	413595	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-257580/1-A		974125	2.59	717756	2.99	
LLCS 320-257580/2-A		1049766	2.59	794682	2.99	
LLCSD 320-257580/3-A		1041506	2.59	777080	2.98	
320-44517-1	WGNA-102418-RW-0437	1075122	2.59	809646	2.98	
320-44517-3	WGNA-102418-RW-3142	1056272	2.61	766847	2.99	
320-44517-4	WGNA-102418-FRB-3142	1073241	2.60	793184	2.98	

13PFOA = 13C2 PFOA  
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits



FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-257875/35 Date Analyzed: 11/08/2018 16:34  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.11.08\_537AA\_03 Heated Purge: (Y/N) N  
 Calibration ID: 41909

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	858756	2.59	671592	2.99		
UPPER LIMIT	1202258	3.09	940229	3.49		
LOWER LIMIT	601129	2.09	470114	2.49		
LAB SAMPLE ID	CLIENT SAMPLE ID					
MB 320-257580/1-A		974125	2.59	717756	2.99	
LLCS 320-257580/2-A		1049766	2.59	794682	2.99	
LLCSD 320-257580/3-A		1041506	2.59	777080	2.98	
320-44517-1	WGNA-102418-RW-0437	1075122	2.59	809646	2.98	
320-44517-3	WGNA-102418-RW-3142	1056272	2.61	766847	2.99	
320-44517-4	WGNA-102418-FRB-3142	1073241	2.60	793184	2.98	

13PFOA = 13C2 PFOA  
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-258311/7 Date Analyzed: 11/10/2018 04:21  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.11.09\_537A\_010 Heated Purge: (Y/N) N  
 Calibration ID: 41909

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	942078	2.58	691642	2.98		
UPPER LIMIT	1318909	3.08	968299	3.48		
LOWER LIMIT	659455	2.08	484149	2.48		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-44517-2	WGNA-102418-FRB-0437		1008361	2.58	698156	2.98

13PFOA = 13C2 PFOA  
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

FORM VIII  
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Sample No.: CCV 320-258311/10 Date Analyzed: 11/10/2018 04:43  
 Instrument ID: A8\_N GC Column: GeminiC18 3x100 ID: 3 (mm)  
 Lab File ID (Standard): 2018.11.09\_537A\_013 Heated Purge: (Y/N) N  
 Calibration ID: 41909

	13PFOA		PFOS		AREA #	RT #
	AREA #	RT #	AREA #	RT #		
12/24 HOUR STD	873615	2.58	672895	2.96		
UPPER LIMIT	1223061	3.08	942053	3.46		
LOWER LIMIT	611531	2.08	471027	2.46		
LAB SAMPLE ID	CLIENT SAMPLE ID					
320-44517-2	WGNA-102418-FRB-0437		1008361	2.58	698156	2.98

13PFOA = 13C2 PFOA  
 PFOS = 13C4 PFOS

Area Limit = 70%-140% of internal standard area  
 RT Limit = ± 0.5 minutes of internal standard RT

# Column used to flag values outside QC limits

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

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1 Analy Batch No.: 254941

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

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

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5		B	M1	M2								
	LVL 6	LVL 7															
Perfluorobutanesulfonic acid (PFBS)	1.1273 1.1348	1.0472 1.1821	1.2473	1.1325	1.0470	Ave		1.1312			6.3		30.0				
Perfluoroheptanoic acid (PFHpA)	1.1170 1.0911	1.0831 1.0164	1.1125	1.0906	1.1077	Ave		1.0883			3.1		30.0				
Perfluorohexanesulfonic acid (PFHxS)	1.7276 1.4629	1.5144 1.5084	1.4933	1.5080	1.4474	Ave		1.5232			6.1		30.0				
Perfluorooctanoic acid (PFOA)	1.2693 1.1068	1.2760 1.0811	1.0751	1.0892	1.1110	Ave		1.1441			7.8		30.0				
Perfluorononanoic acid (PFNA)	0.7828 0.8003	0.9188 0.8042	0.8858	0.8660	0.8198	Ave		0.8397			6.1		30.0				
Perfluorooctanesulfonic acid (PFOS)	1.2092 1.0233	1.3067 1.0468	1.1301	1.0534	1.0463	Ave		1.1166			9.5		30.0				
13C2 PFHxA	0.9719 0.9620	0.9669 0.9685	0.9927	1.0476	1.0117	Ave		0.9888			3.2		30.0				
13C2 PFDA	0.7273 0.6763	0.6718 0.6663	0.6660	0.7153	0.7053	Ave		0.6898			3.7		30.0				

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

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

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1 Analy Batch No.: 254941

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

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

Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (NG/ML)				
			LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5
			LVL 6	LVL 7				LVL 6	LVL 7			
Perfluorobutanesulfonic acid (PFBS)	PFOS	Ave	7850 1805727	15129 3593985	90415	321034	771338	0.0221 4.42	0.0442 8.84	0.221	0.884	2.21
Perfluoroheptanoic acid (PFHpA)	13PF OA	Ave	10502 2168310	20433 4036861	107565	394448	1045338	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorohexanesulfonic acid (PFHxS)	PFOS	Ave	12384 2396371	22521 4720764	111433	440068	1097729	0.0228 4.55	0.0455 9.10	0.228	0.910	2.28
Perfluorooctanoic acid (PFOA)	13PF OA	Ave	11946 2201725	24097 4298280	104050	394334	1049529	0.0250 5.01	0.0501 10.0	0.250	1.00	2.50
Perfluorononanoic acid (PFNA)	13PF OA	Ave	7360 1590432	17333 3194105	85638	313227	773614	0.0250 5.00	0.0500 10.0	0.250	1.00	2.50
Perfluorooctanesulfonic acid (PFOS)	PFOS	Ave	8839 1709437	19817 3340812	86001	313486	809220	0.0232 4.64	0.0464 9.28	0.232	0.928	2.32
13C2 PFHxA	13PF OA	Ave	913787 955852	912101 961713	959790	947296	954767	2.50 2.50	2.50 2.50	2.50	2.50	2.50
13C2 PFDA	13PF OA	Ave	683785 672010	633723 661601	643936	646763	665573	2.50 2.50	2.50 2.50	2.50	2.50	2.50

Curve Type Legend:

Ave = Average ISTD

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

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1 Analy Batch No.: 254941

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

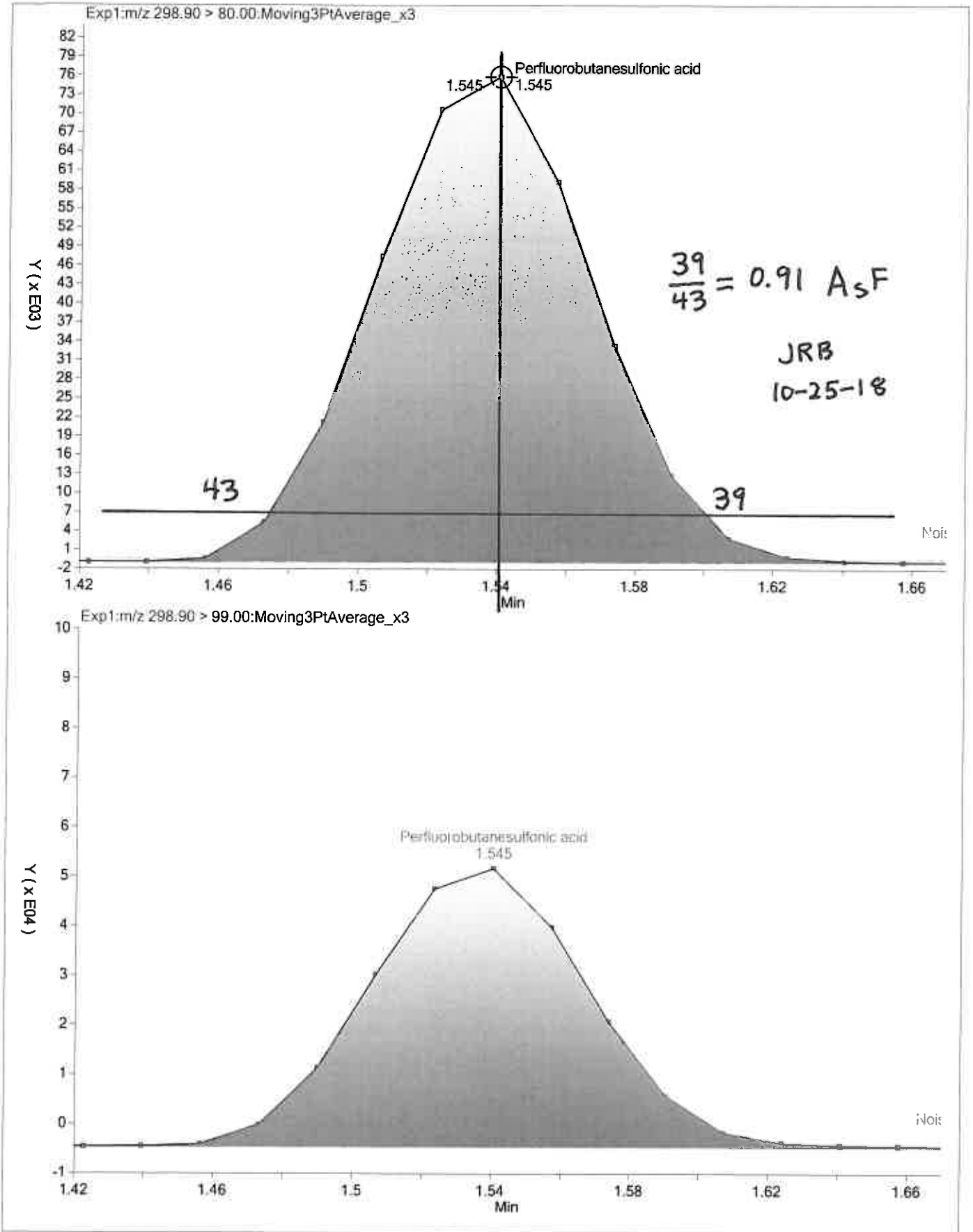
Instrument ID: A8\_N GC Column: GeminiC18 3 ID: 3(mm) Heated Purge: (Y/N) N

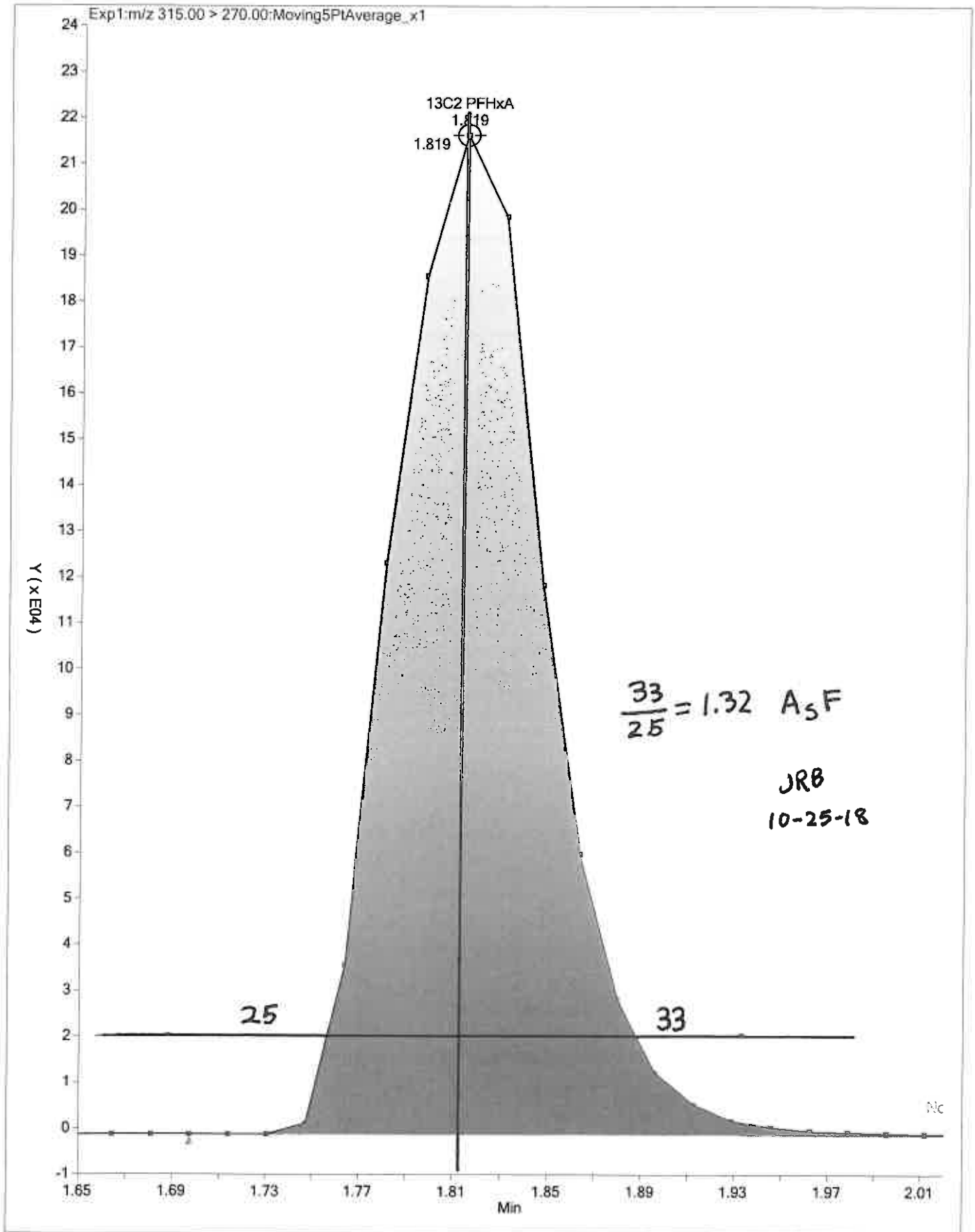
Calibration Start Date: 10/25/2018 14:59 Calibration End Date: 10/25/2018 15:43 Calibration ID: 41909

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	IC 320-254941/2	2018.10.25_537ICAL_003.d
Level 2	IC 320-254941/3	2018.10.25_537ICAL_004.d
Level 3	IC 320-254941/4	2018.10.25_537ICAL_005.d
Level 4	IC 320-254941/5	2018.10.25_537ICAL_006.d
Level 5	IC 320-254941/6	2018.10.25_537ICAL_007.d
Level 6	IC 320-254941/7	2018.10.25_537ICAL_008.d
Level 7	IC 320-254941/8	2018.10.25_537ICAL_009.d

ANALYTE	PERCENT ERROR						PERCENT ERROR LIMIT					
	LVL 1 # LVL 7 #	LVL 2 #	LVL 3 #	LVL 4 #	LVL 5 #	LVL 6 #	LVL 1 LVL 7	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6
Perfluorobutanesulfonic acid (PFBS)	-0.3 4.5	-7.4	10.3	0.1	-7.4	0.3	50 30	30	30	30	30	30
Perfluoroheptanoic acid (PFHpA)	2.6 -6.6	-0.5	2.2	0.2	1.8	0.3	50 30	30	30	30	30	30
Perfluorohexanesulfonic acid (PFHxS)	13.4 -1.0	-0.6	-2.0	-1.0	-5.0	-4.0	50 30	30	30	30	30	30
Perfluorooctanoic acid (PFOA)	10.9 -5.5	11.5	-6.0	-4.8	-2.9	-3.3	50 30	30	30	30	30	30
Perfluorononanoic acid (PFNA)	-6.8 -4.2	9.4	5.5	3.1	-2.4	-4.7	50 30	30	30	30	30	30
Perfluorooctanesulfonic acid (PFOS)	8.3 -6.3	17.0	1.2	-5.7	-6.3	-8.3	50 30	30	30	30	30	30
13C2 PFHxA	-1.7 -2.0	-2.2	0.4	6.0	2.3	-2.7	30 30	30	30	30	30	30
13C2 PFDA	5.4 -3.4	-2.6	-3.4	3.7	2.2	-1.9	30 30	30	30	30	30	30







FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-254941/10 Calibration Date: 10/25/2018 15:58  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.10.25\_537ICAL\_011.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.160		9.00	0.0442	2.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.236		1.00	0.0500	13.6	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.856		3.00	0.0455	21.8	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.011		2.00	0.0501	-11.6	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8737		5.00	0.0500	4.1	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	0.9171		4.00	0.0464	-17.9	50.0
13C2 PFHxA	Ave	0.9888	1.053		2.66	2.50	6.5	30.0
13C2 PFDA	Ave	0.6898	0.6953		2.52	2.50	0.8	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: ICV 320-254941/12 Calibration Date: 10/25/2018 16:12  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.10.25\_537ICAL\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.180		9.00	1.77	4.3	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.136		2.09	2.00	4.4	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.516		1.82	1.82	-0.5	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.037		1.81	2.00	-9.4	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8648		2.06	2.00	3.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.116		1.85	1.85	-0.0	30.0
13C2 PFHxA	Ave	0.9888	1.084		2.74	2.50	9.7	30.0
13C2 PFDA	Ave	0.6898	0.7056		2.56	2.50	2.3	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-257836/1 Calibration Date: 11/08/2018 10:54  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.08\_537AA\_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.297		9.00	0.0442	14.6	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.104		1.00	0.0500	1.4	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.641		3.00	0.0455	7.7	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.234		2.00	0.0501	7.8	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.9443		5.00	0.0500	12.5	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.389		4.00	0.0464	24.4	50.0
13C2 PFHxA	Ave	0.9888	1.016		2.57	2.50	2.7	30.0
13C2 PFDA	Ave	0.6898	0.6893		2.50	2.50	-0.0	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-257875/24 Calibration Date: 11/08/2018 15:12  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.08\_537AA\_028.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.149		9.00	0.884	1.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.094		1.00	1.00	0.5	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.565		3.00	0.910	2.7	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.099		0.961	1.00	-4.0	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8317		5.00	1.00	-1.0	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.062		4.00	0.928	-4.9	30.0
13C2 PFHxA	Ave	0.9888	0.9485		2.40	2.50	-4.1	30.0
13C2 PFDA	Ave	0.6898	0.6763		2.45	2.50	-1.9	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-257875/35 Calibration Date: 11/08/2018 16:34  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.08\_537AA\_039.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.124		4.39	4.42	-0.6	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.112		5.11	5.00	2.2	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.526		4.56	4.55	0.2	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.060		4.64	5.01	-7.3	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.8535		5.08	5.00	1.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.072		4.45	4.64	-4.0	30.0
13C2 PFHxA	Ave	0.9888	1.028		2.60	2.50	4.0	30.0
13C2 PFDA	Ave	0.6898	0.6868		2.49	2.50	-0.4	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCVL 320-258157/1 Calibration Date: 11/10/2018 03:37  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.09\_537A\_004.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.551		9.00	0.0442	37.1	50.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.507		1.00	0.0500	38.5	50.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	2.451		3.00	0.0455	60.9*	50.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.058		2.00	0.0501	-7.5	50.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	1.007		5.00	0.0500	19.9	50.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	2.583		4.00	0.0464	131.3*	50.0
13C2 PFHxA	Ave	0.9888	0.9738		2.46	2.50	-1.5	30.0
13C2 PFDA	Ave	0.6898	0.6544		2.37	2.50	-5.1	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-258311/7 Calibration Date: 11/10/2018 04:21  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.09\_537A\_010.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.177		4.60	4.42	4.0	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.025		4.71	5.00	-5.8	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.478		4.41	4.55	-3.0	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.051		4.60	5.01	-8.2	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.7733		4.60	5.00	-7.9	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.119		4.65	4.64	0.2	30.0
13C2 PFHxA	Ave	0.9888	0.9823		2.48	2.50	-0.7	30.0
13C2 PFDA	Ave	0.6898	0.6911		2.50	2.50	0.2	30.0

FORM VII  
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1  
 SDG No.: \_\_\_\_\_  
 Lab Sample ID: CCV 320-258311/10 Calibration Date: 11/10/2018 04:43  
 Instrument ID: A8\_N Calib Start Date: 10/25/2018 14:59  
 GC Column: GeminiC18 3x100 ID: 3.00 (mm) Calib End Date: 10/25/2018 15:43  
 Lab File ID: 2018.11.09\_537A\_013.d Conc. Units: ng/mL

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Perfluorobutanesulfonic acid (PFBS)	Ave	1.131	1.150		9.00	0.884	1.7	30.0
Perfluoroheptanoic acid (PFHpA)	Ave	1.088	1.070		0.984	1.00	-1.6	30.0
Perfluorohexanesulfonic acid (PFHxS)	Ave	1.523	1.511		3.00	0.910	-0.8	30.0
Perfluorooctanoic acid (PFOA)	Ave	1.144	1.093		0.956	1.00	-4.5	30.0
Perfluorononanoic acid (PFNA)	Ave	0.8397	0.7998		5.00	1.00	-4.7	30.0
Perfluorooctanesulfonic acid (PFOS)	Ave	1.117	1.090		4.00	0.928	-2.3	30.0
13C2 PFHxA	Ave	0.9888	0.9776		2.47	2.50	-1.1	30.0
13C2 PFDA	Ave	0.6898	0.7057		2.56	2.50	2.3	30.0



LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Instrument ID: A8\_N Start Date: 10/25/2018 14:59

Analysis Batch Number: 254941 End Date: 10/25/2018 16:12

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
IC 320-254941/2		10/25/2018 14:59	1	2018.10.25_537I CAL 003.d	GeminiC18 3x100 3(mm)
IC 320-254941/3		10/25/2018 15:06	1	2018.10.25_537I CAL 004.d	GeminiC18 3x100 3(mm)
IC 320-254941/4		10/25/2018 15:14	1	2018.10.25_537I CAL 005.d	GeminiC18 3x100 3(mm)
IC 320-254941/5 ICISAV		10/25/2018 15:21	1	2018.10.25_537I CAL 006.d	GeminiC18 3x100 3(mm)
IC 320-254941/6		10/25/2018 15:29	1	2018.10.25_537I CAL 007.d	GeminiC18 3x100 3(mm)
IC 320-254941/7		10/25/2018 15:36	1	2018.10.25_537I CAL 008.d	GeminiC18 3x100 3(mm)
IC 320-254941/8		10/25/2018 15:43	1	2018.10.25_537I CAL 009.d	GeminiC18 3x100 3(mm)
CCVL 320-254941/10		10/25/2018 15:58	1	2018.10.25_537I CAL 011.d	GeminiC18 3x100 3(mm)
ICB 320-254941/11		10/25/2018 16:05	1		GeminiC18 3x100 3(mm)
ICV 320-254941/12		10/25/2018 16:12	1	2018.10.25_537I CAL 013.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Instrument ID: A8\_N Start Date: 11/08/2018 10:54

Analysis Batch Number: 257836 End Date: 11/08/2018 10:54

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-257836/1		11/08/2018 10:54	1	2018.11.08_537A A 004.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Instrument ID: A8\_N Start Date: 11/08/2018 15:12

Analysis Batch Number: 257875 End Date: 11/08/2018 16:34

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-257875/24 CCVIS		11/08/2018 15:12	1	2018.11.08_537A A 028.d	GeminiC18 3x100 3(mm)
MB 320-257580/1-A		11/08/2018 15:27	1	2018.11.08_537A A 030.d	GeminiC18 3x100 3(mm)
LLCS 320-257580/2-A		11/08/2018 15:35	1	2018.11.08_537A A 031.d	GeminiC18 3x100 3(mm)
LLCSD 320-257580/3-A		11/08/2018 15:42	1	2018.11.08_537A A 032.d	GeminiC18 3x100 3(mm)
320-44517-1		11/08/2018 15:49	1	2018.11.08_537A A 033.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/08/2018 15:57	1		GeminiC18 3x100 3(mm)
320-44517-3		11/08/2018 16:04	1	2018.11.08_537A A 035.d	GeminiC18 3x100 3(mm)
320-44517-4		11/08/2018 16:11	1	2018.11.08_537A A 036.d	GeminiC18 3x100 3(mm)
ZZZZZ		11/08/2018 16:19	1		GeminiC18 3x100 3(mm)
ZZZZZ		11/08/2018 16:26	1		GeminiC18 3x100 3(mm)
CCV 320-257875/35 CCVIS		11/08/2018 16:34	1	2018.11.08_537A A 039.d	GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Instrument ID: A8\_N Start Date: 11/10/2018 03:37

Analysis Batch Number: 258157 End Date: 11/10/2018 04:21

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCVL 320-258157/1		11/10/2018 03:37	1	2018.11.09_537A 004.d	GeminiC18 3x100 3(mm)
CCV 320-258157/7 CCVIS		11/10/2018 04:21	1		GeminiC18 3x100 3(mm)

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Instrument ID: A8\_N Start Date: 11/10/2018 04:21

Analysis Batch Number: 258311 End Date: 11/10/2018 04:43

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
CCV 320-258311/7 CCVIS		11/10/2018 04:21	1	2018.11.09_537A 010.d	GeminiC18 3x100 3(mm)
320-44517-2		11/10/2018 04:36	1	2018.11.09_537A 012.d	GeminiC18 3x100 3(mm)
CCV 320-258311/10 CCVIS		11/10/2018 04:43	1	2018.11.09_537A 013.d	GeminiC18 3x100 3(mm)

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Batch Number: 257580 Batch Start Date: 11/07/18 10:40 Batch Analyst: Long, Tyrel W

Batch Method: 537 Batch End Date: 11/07/18 17:00

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	ReceivedpH	LC537-IS 00087
MB 320-257580/1		537, 537				250 mL	10.00 mL	7 SU	500 uL
LLCS 320-257580/2		537, 537				250 mL	10.00 mL	7 SU	500 uL
LLCSD 320-257580/3		537, 537				250 mL	10.00 mL	7 SU	500 uL
320-44517-A-1	WGNA-102418-RW-0437	537, 537	T	299.40 g	28.55 g	270.9 mL	10.00 mL	7 SU	500 uL
320-44517-A-2	WGNA-102418-FRB-0437	537, 537	T	318.80 g	28.76 g	290 mL	10.00 mL	7 SU	500 uL
320-44517-A-3	WGNA-102418-RW-3142	537, 537	T	329.15 g	28.98 g	300.2 mL	10.00 mL	7 SU	500 uL
320-44517-A-4	WGNA-102418-FRB-3142	537, 537	T	314.74 g	28.43 g	286.3 mL	10.00 mL	7 SU	500 uL

Lab Sample ID	Client Sample ID	Method Chain	Basis	LC537-SU 00085	LC537LSP 00002	AnalysisComment			
MB 320-257580/1		537, 537		500 uL		Chlorine ND			
LLCS 320-257580/2		537, 537		500 uL	500 uL	Chlorine ND			
LLCSD 320-257580/3		537, 537		500 uL	500 uL	Chlorine ND			
320-44517-A-1	WGNA-102418-RW-0437	537, 537	T	500 uL		Chlorine ND			
320-44517-A-2	WGNA-102418-FRB-0437	537, 537	T	500 uL		Chlorine ND			
320-44517-A-3	WGNA-102418-RW-3142	537, 537	T	500 uL		Chlorine ND			
320-44517-A-4	WGNA-102418-FRB-3142	537, 537	T	500 uL		Chlorine ND			

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Sacramento Job No.: 320-44517-1

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

Batch Number: 257580 Batch Start Date: 11/07/18 10:40 Batch Analyst: Long, Tyrel W

Batch Method: 537 Batch End Date: 11/07/18 17:00

Batch Notes	
Analyst ID - Aliquot Step	TWL
Batch Comment	Client labels match TA labels TWL 11/7/18
Analyst ID - Final Volume Step	TWL
Internal Standard ID#	1408095
Manifold ID	M
Methanol ID	1423730
pH Indicator ID	3718
Pipette ID	I46345G
Analyst ID - IS Reagent Drop	TWL
Analyst ID - IS Reagent Drop Witness	KJP
Analyst ID - SU Reagent Drop	TWL
Analyst ID - SU Reagent Drop Witness	MYV
Analyst ID - TA Reagent Drop	TWL
Analyst ID - TA Reagent Drop Witness	MYV
SPE Cartridge Lot ID	6413635-03
Trizma ID	SLBR5241V
Reagent Water ID	11/03/18

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

PFAS Calibration Calculations:

**Initial Calibration**  
Instrument A8\_N

10/25/2018

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	Reported RRF
0.025	11946	940209	2.5	1.27057	1.2693
0.0501	24097	943285	2.5	1.27474	1.276
0.25	104050	966840	2.5	1.07619	1.0751
1	394334	904232	2.5	1.09025	1.0892
2.5	1049529	943717	2.5	1.11212	1.111
5	2201725	993600	2.5	1.10795	1.1068
10	4298280	992963	2.5	1.08219	1.0811
Average				1.14486	1.1441
Standard Deviation				0.0883	
RSD				0.0771	
%RSD				7.70874	7.8

**Continuing Calibration**

11/08/2018 @ 15:12

PFOA

Analyte Concentration	Analyte Response	Internal Standard Response	Internal Standard Amount	RRF	%D	Reported RRF	Reported %D
1	352470	801193	2.5	1.0998	-3.869537	1.099	-4

**Sample Identification**  
Compound

WGNA-102418-RW-0437  
PFOA

Compound Area	322338	Average RRF	1.144
Internal Standard Amount (ng)	2.5	Sample Volume(ml)	270.9
Dilution Factor	1	Volume Extract (ml)	10
Internal Standard Area	1075122		

Concentration	24.1857 ng/L
Reported Result	24 ng/L

**Surrogate PFHxA**

Compound Area	1070059		
Internal Standard Amount (ng)	10		
Dilution Factor	1	Volume Extract (ml)	1
Internal Standard Area	1075122	Injection Volume (µl)	1
Average RRF	0.9888		
Concentration	10.0656		
Surrogate %R	100.66	Spike amount	10

**LCS %R**

320-257580/2-A			
PFOA	Spike amount	LCS concentration	
89.75	4	3.59	



TestAmerica Sacramento  
Target Compound Quantitation Report

Data File: \\ChromNa\Sacramento\ChromData\A8\_N\20181108-67354.b\2018.11.08\_537AA\_033.d  
 Lims ID: 320-44517-A-1-A  
 Client ID: WGNA-102418-RW-0437  
 Sample Type: Client  
 Inject. Date: 08-Nov-2018 15:49:51 ALS Bottle#: 23 Worklist Smp#: 29  
 Injection Vol: 10.0 ul Dil. Factor: 1.0000  
 Sample Info: 320-44517-a-1-a  
 Misc. Info.: Plate: 1 Rack: 2  
 Operator ID: SACINSTLCMS01 Instrument ID: A8\_N  
 Method: \\ChromNa\Sacramento\ChromData\A8\_N\20181108-67354.b\537\_A8\_N.m  
 Limit Group: LC 537 ICAL  
 Last Update: 08-Nov-2018 17:26:56 Calib Date: 25-Oct-2018 15:43:40  
 Integrator: Picker  
 Quant Method: Internal Standard Quant By: Initial Calibration  
 Last ICal File: \\ChromNa\Sacramento\ChromData\A8\_N\20181025-66581.b\2018.10.25\_537ICAL\_009.d  
 Column 1 : Det: EXP1  
 Process Host: XAWRK008

First Level Reviewer: barnettj Date: 08-Nov-2018 17:20:45

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
1 Perfluorobutanesulfonic acid									
298.90 > 80.00	1.561	1.561	0.0	1.000	190496	0.4971		138	
298.90 > 99.00	1.545	1.561	-0.016	0.990	119246		1.60(0.00-0.00)	120	
13 Perfluorohexanoic acid									
313.00 > 269.00	1.819	1.819	0.0	0.702	96651	0.2528		16.9	M
313.00 > 119.00	1.819	1.819	0.0	0.702	9154		10.56(0.00-0.00)	16.9	M
\$ 2 13C2 PFHxA									
315.00 > 270.00	1.835	1.835	0.0	1.000	1070059	2.52		4270	
4 Perfluoroheptanoic acid									
363.00 > 319.00	2.205	2.205	0.0	1.000	85305	0.1823		10.3	M
363.00 > 169.00	2.205	2.205	0.0	1.000	33109		2.58(0.00-0.00)	27.8	M
3 Perfluorohexanesulfonic acid									
399.00 > 80.00	2.237	2.237	0.0	1.000	204512	0.3963		125	
399.00 > 99.00	2.237	2.237	0.0	1.000	69937		2.92(0.00-0.00)	49.3	
* 5 13C2 PFOA									
415.00 > 370.00	2.591	2.592	-0.001		1075122	2.50		5022	
6 Perfluorooctanoic acid									
413.00 > 369.00	2.591	2.592	-0.001	1.000	322338	0.6551		25.1	M
413.00 > 169.00	2.591	2.592	-0.001	1.000	198161		1.63(0.00-0.00)	159	M
9 Perfluorononanoic acid									
463.00 > 419.00	2.978	2.978	0.0	1.000	23920	0.0662		2.9	M
463.00 > 169.00	2.946	2.978	-0.032	0.989	7172		3.34(0.00-0.00)	12.7	M
* 7 13C4 PFOS									
503.00 > 80.00	2.978	2.994	-0.016		809646	2.39		1150	
8 Perfluorooctanesulfonic acid									
499.00 > 80.00	2.978	2.994	-0.016	1.000	244467	0.6463		108	
499.00 > 99.00	2.978	2.994	-0.016	1.000	48396		5.05(0.00-0.00)	61.8	
\$ 10 13C2 PFDA									
515.00 > 470.00	3.348	3.348	0.0	1.000	730901	2.46		3057	

Signal	RT	EXP RT	DLT RT	REL RT	Response	Amount ng/ml	Ratio(Limits)	S/N	Flags
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\* 12 d3-NMeFOSAA

573.00 > 419.00 3.509 3.509 0.0 355324 2.50 2112

\$ 11 d5-NEtFOSAA

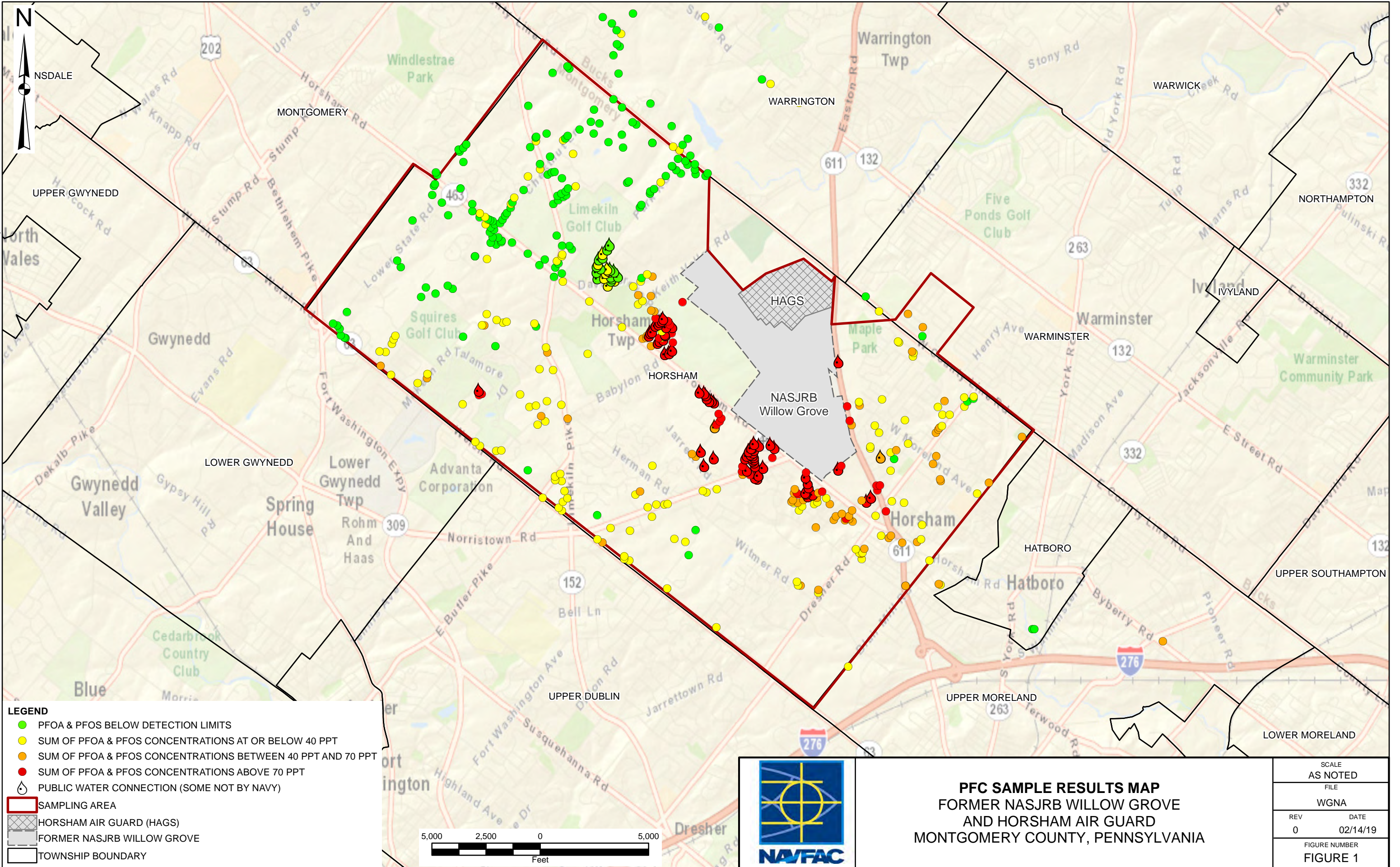
589.00 > 419.00 3.670 3.670 0.0 1.046 356185 2.32 392

**QC Flag Legend**

Review Flags

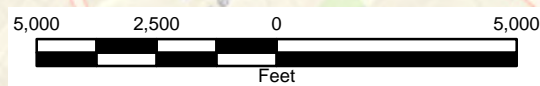
M - Manually Integrated

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**LEGEND**

- PFOA & PFOS BELOW DETECTION LIMITS
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- HORSHAM AIR GUARD (HAGS)
- FORMER NASJRB WILLOW GROVE
- TOWNSHIP BOUNDARY



**PFC SAMPLE RESULTS MAP  
FORMER NASJRB WILLOW GROVE  
AND HORSHAM AIR GUARD  
MONTGOMERY COUNTY, PENNSYLVANIA**

SCALE AS NOTED	
FILE WGNA	
REV 0	DATE 02/14/19
FIGURE NUMBER <b>FIGURE 1</b>	