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FINAL PER AND POLYFLUOROALKYL SUBSTANCES GROUNDWATER PRELIMINARY ASSESSMENT AND SITE INSPECTION SITE 13 FORMER FIRE TRAINING UNIT NS PHILADELPHIA PA

09/01/2020

TETRA TECH

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BRAC Program Management Office East
Philadelphia, Pennsylvania

Final
Per- and Polyfluoroalkyl Substances Groundwater Preliminary Assessment/Site Inspection

Site 13 – Former Fire Training Unit

Former Naval Station Philadelphia
Philadelphia, Pennsylvania

September 2020

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FINAL
PER- AND POLYFLUOROALKYL SUBSTANCES GROUNDWATER PRELIMINARY ASSESSMENT/SITE INSPECTION

SITE 13 – FORMER FIRE TRAINING UNIT

FORMER NAVAL STATION PHILADELPHIA
PHILADELPHIA, PENNSYLVANIA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Department of the Navy
Base Realignment and Closure Program Management Office East
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Philadelphia, Pennsylvania 19112

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CONTRACT NUMBER N6247016D9008
CONTRACT TASK ORDER WE14

SEPTEMBER 2020

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Acronyms and Abbreviations

AFFF	Aqueous film forming foam
bgs	Below ground surface
CLEAN	Comprehensive Long-Term Environmental Action Navy
CTO	Contract Task Order
DPT	Direct push technology
FFTU	Former Fire Training Unit
IDW	Investigation-derived waste
LUC	Land use control
MIDLANT	Mid-Atlantic
NAVFAC	Naval Facilities Engineering Command
NAVSTA	Naval Station
ng/L	Nanogram per liter
PA/SI	Preliminary Assessment/Site Inspection
PFAS	Per- and polyfluoroalkyl substance
PFBS	Perfluorobutanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PIDC	Philadelphia Industrial Development Corporation
PNBC	Philadelphia Naval Business Center
PVC	Polyvinyl chloride
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SOW	Statement of Work
USEPA	United States Environmental Protection Agency
UST	Underground storage tank

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1.0 Introduction

1.1 Overview

This Per- and Polyfluoroalkyl Substances (PFAS) Groundwater Preliminary Assessment/Site Inspection (PA/SI) Report was prepared for BRAC Program Management Office East as part of Contract Task Order (CTO) WE14 under Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N6247016D9008. This report summarizes the field activities and sampling results of the groundwater investigation conducted by Tetra Tech at Former Naval Station (NAVSTA) Philadelphia in Philadelphia, Pennsylvania, in accordance with the *Sampling and Analysis Plan, (Field Sampling Plan and Quality Assurance Project Plan) for Groundwater Investigation, Site 13 - Former Fire Training Unit, Naval Station Philadelphia* (Tetra Tech, 2019). The investigation tasks were initially scoped in a Statement on Work (SOW) prepared by the Navy and included the installation, sampling and abandonment of eight temporary groundwater monitoring wells in the area, and immediately downgradient, of the former fire training unit (FFTU).

1.2 Investigation Objectives

The purpose of this groundwater investigation was to assess if PFAS contamination is present in shallow groundwater at Site 13 at concentrations exceeding the PFAS screening levels for groundwater not used as drinking water (see Section 4.1 for a discussion of screening levels). The information gathered will be used to determine if additional assessment for PFAS at Site 13 is warranted.

1.3 Report Organization

Section 1 presents a brief overview of the project and project objectives, Section 2 summarizes the historical information available for the site, and Section 3 provides a description of the field investigation. Sections 4 and 5 discuss the findings of the investigation and conclusions drawn, respectively. Supporting documentation includes copies of well logs (Appendix A), sample log sheets (Appendix B), investigation-derived waste paperwork (Appendix C), data validation reports (Appendix D), and analytical data summary (Appendix E). Tables and figures are provided to present results and show sampling locations and pertinent site features.

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2.0 Background Information

2.1 Location and Site Information

The former NAVSTA Philadelphia facility is located in Philadelphia, Pennsylvania, near the confluence of the Schuylkill and Delaware Rivers. The FFTU or Site 13, is located adjacent to the Girard Point Management area in the northwestern corner of the former NAVSTA Philadelphia facility. The area surrounding the site is densely populated within 1 mile to the northeast and heavily industrialized with oil refining and petrochemical plants within 1 mile to the north. The site is bounded to the south by Philadelphia Industrial Development Corporation (PIDC) property and includes a mix of office, industrial, manufacturing, and research and development sectors. A railroad spur and 26th Street are located to the east of the site. A scrap iron yard was formerly located north the site; various industrial properties are currently located adjacent to the northern and western sides of the site. The Schuylkill River and Naval Reserve Basin are approximately 1200 feet south-southwest of the site. The location of the former NAVSTA Philadelphia facility is shown on Figure 2-1. Figure 2-2 shows the historical layout of the FFTU when the site was active.

2.2 Site Description

Firefighting training activities occurred regularly at the former FFTU from 1944 through September 1995. The training activities included distribution and ignition of fuel (diesel, gasoline, and fuel oil) with subsequent extinguishing of the created fires. The materials used to extinguish the fires flowed into drains located near the simulation structures and then to oil-water separators. The water was discharged to the sanitary sewer, and waste oil was collected and subsequently, managed by Navy. An underground fuel distribution system was in place at the site. Historical site figures identify a foam tank located at Site 13 (see Figure 2-2); however, it is unknown whether the foam contents were PFAS-containing aqueous film forming foam (AFFF) or if AFFF was used at the site (EA, 1999).

Historically, three underground storage tanks (USTs) supplied diesel fuel, gasoline, and fuel oil to burn stations on the northern end of the fire field. However, as a result of failed tank-tightness tests, two of the three USTs (A3-002 and A3-003) were removed in 1990. A third UST (A3-001) was removed from the northern end of the site in 1995 (EA, 1999).

A Remedial Investigation was conducted in four phases from 1990 through 1995.

Phase I included soil boring advancement and installation and sampling of four monitoring wells. Phase II included additional subsurface soil sampling and installation of three additional monitoring wells, and Phase III included another round of groundwater sampling. The first three phases indicated that additional data collection activities were needed to obtain site closure and that a risk assessment was required. Phase IV included resampling of all monitoring wells and collection of subsurface soil samples. Samples collected during the first three phases were analyzed for volatile organic compounds and semivolatile organic compounds including polycyclic aromatic hydrocarbons. Phase IV included analysis for parameters included in the first three phases in addition to analysis for metals, pesticides, and polychlorinated biphenyls. Because several metals and semivolatile organic compounds were detected at concentrations greater than screening levels in soils and groundwater, a risk assessment was also performed. Risk assessment results indicated that calculated carcinogenic risks were within United States Environmental Protection Agency's (USEPA's) acceptable risk range and non-carcinogenic hazards were less than the target hazard index of 1.0 for all exposure scenarios; therefore, a no further remedial action determination was made (EA, 1999).

A Decision Document for No Further Action for Site 13 was signed by the Navy in November 1999, and the property was transferred to PIDC in 2000.

2.3 Potential Sources of PFAS

PFAS have been used in a variety of military operations, including as a historical component in AFFF used for fire suppression. PFAS may be present at elevated concentrations in areas where firefighting support activities were conducted; where accidental releases of AFFF have occurred; where AFFF equipment testing, training, and equipment washout was performed; where oil-water separators are located; and where piping associated with AFFF for use in other operations is in place or has been removed (e.g., tanks, AFFF conveyance lines).

The FFTU is a potential source of PFAS contamination because of the previous presence of a foam storage tank and potential historical use of AFFF at the site (EA, 1999).

2.4 Hydrogeology

The geologic units beneath former NAVSTA Philadelphia are part of the Potomac Group and Raritan Formation, which are composed of interbedded gravel, silt, sand, and clay units. These sediments comprise the Potomac-Raritan-Magothy aquifer system, which is subdivided into the following units: lower sand, lower clay, middle sand, middle clay,

upper sand, and upper clay. Much of the shallow subsoil is reworked fill and made-land from dredge spoils from the Delaware River (EA, 1999).

Site 13 local geology generally consists of a surficial sand and gravel unit, which extends from below paving to a depth of approximately 4 feet, underlain by a sandy silt lithology and then a well-graded sand. Two water-bearing zones have been identified: a perched water layer in the low permeability sandy silt, and regional water in the lower sand lithology. Water in the upper water-bearing unit flows toward the southwest toward the nearby Schuylkill River (see Figure 2-1). Groundwater in the lower water-bearing unit flows toward the southeast toward the Naval Reserve Basin and Delaware River. Vertical gradients indicate downward flow from the upper to the lower water bearing zone (EA, 1999).

2.5 Current Land Use

Portions of the former NAVSTA Philadelphia including Site 13, were transferred to PIDC in 2000 and have been redeveloped for commercial and industrial use. The area previously occupied by the FFTU has been redeveloped into a business park that now includes several buildings used by various tenants for manufacturing, research and development, and other commercial activities. Land use controls (LUCs) were established by the Navy as part of the property transfer and prohibit the installation of groundwater wells for potable use.

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TETRA TECH

SITE LOCATION MAP
FORMER FIRE TRAINING UNIT - SITE B
FORMER NAVAL STATION PHILADELPHIA
PHILADELPHIA, PENNSYLVANIA

SCALE	
PER SCALE BAR	
FILE	
SITE LOCATION	
REV	DATE
0	10/16/19
FIGURE NUMBER	
2-1	

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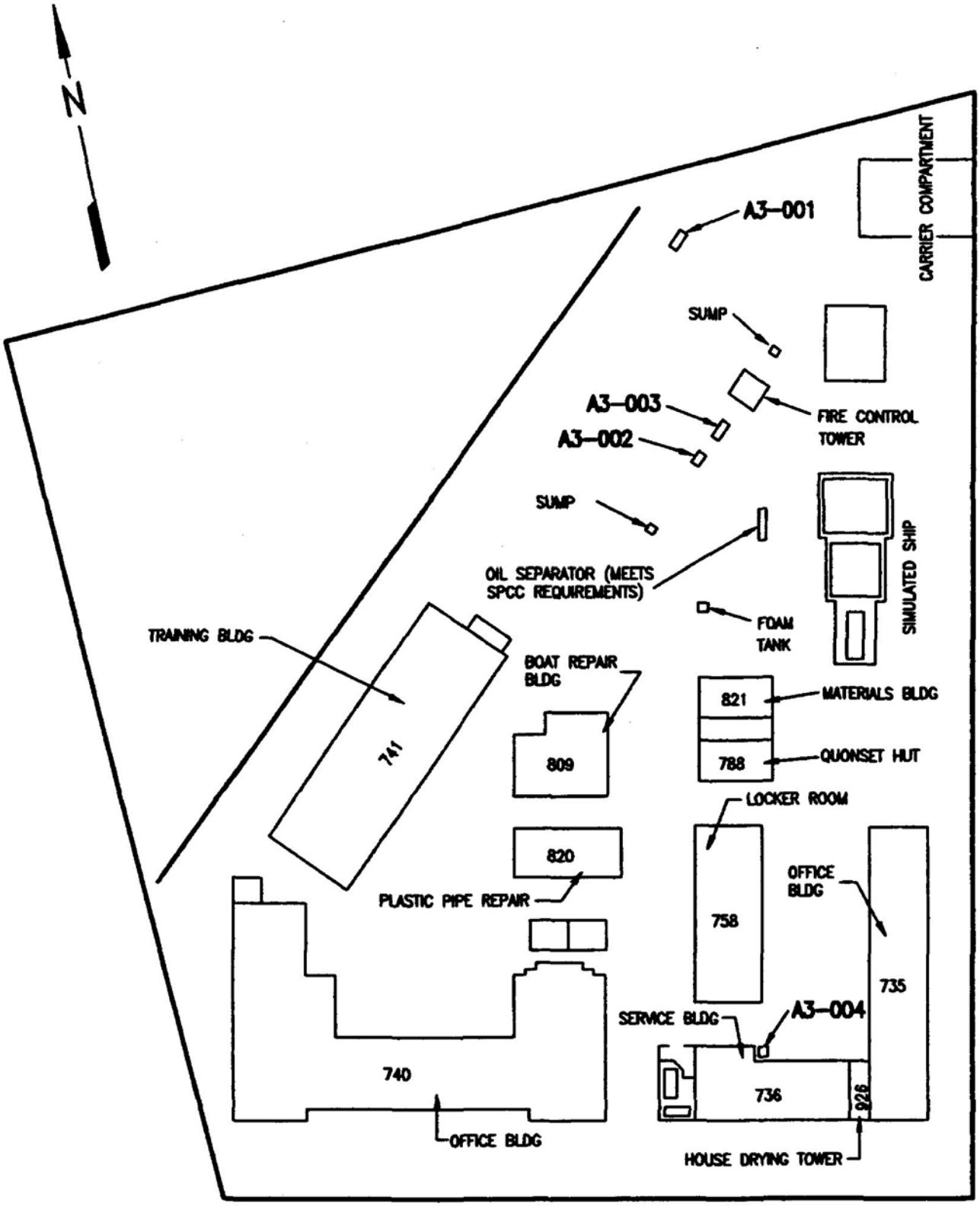

TETRA TECH

SITE 13
FORMER FIRE TRAINING UNIT
FORMER NAVAL STATION
PHILADELPHIA, PENNSYLVANIA

SCALE	GRAPHIC NOT TO SCALE
FILE	SITE 13 FTA
REV	0
DATE	11/13/18
FIGURE NUMBER	2-2

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3.0 Project Tasks Performed

This section briefly describes the field investigation tasks and data evaluation procedures used during 2019 groundwater monitoring well installation, sampling event, and monitoring well abandonment performed at Site 13. Field activities were conducted in accordance with the SAP (Tetra Tech, 2019) and a site meeting held on July 2, 2019, among representatives from the Navy; site property owners L/S 26th Street North LP; Manko, Gold, Katcher, Fox LLP; and Tetra Tech.

3.1 Groundwater Monitoring Well Installation

Five temporary groundwater monitoring wells were installed on August 10 and 11, 2019 in accordance with the procedures outlined in the approved SAP at locations 2, 3, 4, 7, and 8 (as shown on Figure 3-1). Eight groundwater monitoring wells had been proposed to be installed at Site 13 (Figure 3-1); however, a utility mark out conducted on August 7, 2019 indicated electrical lines and high-voltage duct banks near proposed monitoring well locations 1, 5, and 6. The electrical utilities, as well as a steep berm at proposed monitoring well location 1, left insufficient space to safely install the proposed groundwater monitoring wells at these locations. Tetra Tech coordinated with the Navy during utility mark out and well installation activities regarding approval of the final drilling locations. Well locations were restricted to small grass covered islands located within the parking lot, which precluded the option of moving these proposed monitoring well locations away from utilities and/or to areas suitable for safe equipment staging.

The temporary groundwater monitoring wells were installed to depths of 25 feet below ground surface (bgs) using direct-push technology (DPT) at locations 2, 3, 4, 7, and 8, as shown on Figure 3-1. Monitoring wells were constructed of 1-inch-diameter polyvinyl chloride (PVC) well screen and riser pipe. The well screens were 5 feet in length with a slot size of 0.010 inch (10-slot). The well screen and riser pipe were connected using threaded connections fitted with O-rings. No glue or any other materials were used to connect the pipe segments. The temporary groundwater monitoring wells were screened primarily in a sand/silty sand layer from approximately 20 to 25 feet bgs. Non-disposable components of the DPT rig used for well installation were decontaminated after each well was installed.

Tetra Tech geologists were on site during monitoring well installation to log each borehole. The well logs, included as Appendix A, describe the lithology, yield, photoionization detector readings, and other observations of the borehole cuttings. Well

location horizontal coordinates were surveyed using a hand-held Global Positioning System unit.

3.2 Groundwater Sampling

Groundwater samples were collected on August 12, 2019 from the five temporary groundwater monitoring wells. As outlined in the approved SAP, sampling was conducted 24 to 48 hours after installation of the temporary wells. Groundwater samples were obtained following Tetra Tech Standard Operating Procedure SA-1.8 (“Sample Acquisition for Perfluoroalkyl and Polyfluoroalkyl Substances Analysis”). A low-flow purging and sampling method was used to collect the samples, in accordance with the USEPA Region 3 low-flow sampling procedure (USEPA, 1999). As per SOP SA-1.8, PFAS-containing sampling materials were not used during groundwater sampling. Groundwater samples were placed in laboratory-provided containers, preserved as required per analytical methods, stored on ice, and transported under chain -of -custody to Battelle Laboratories, a Department of Defense Environmental Laboratory Accreditation Program-accredited laboratory.

Monitoring wells were pumped at rates between 0.1 to 0.4 liters per minute, and water levels in each well were monitored to ensure that the static water level did not draw down into or below the well screen. Field measurements of water quality parameters, consisting of pH, temperature, specific conductivity, turbidity, dissolved oxygen, and oxidation-reduction potential, were monitored during purging. Pumping rates and other field data were recorded in the field logbook and on the appropriate sample log sheets. Sample log sheets for the monitoring well are included in Appendix B. The groundwater samples were collected after the water quality parameters stabilized, as defined in the SAP. Monitoring well purge water and sampling equipment decontamination water was transferred to a drum for waste characterization sampling and disposal.

3.3 Groundwater Monitoring Well Abandonment

The temporary groundwater monitoring wells were abandoned on August 13, 2019, after collection of the groundwater samples. Monitoring wells were abandoned by removing the PVC well casings and screens and adding bentonite pellets to within 6 to 12 inches of the ground surface, and then filling the remainder of each borehole with topsoil.

3.4 IDW Management

Investigation-derived waste (IDW) produced during sampling consisted of soil cuttings and aqueous materials (groundwater generated during groundwater purging and sampling, and decontamination water) and personal protective equipment. Solid and aqueous wastes were placed in separate 55-gallon drums that were dated and labeled as appropriate. IDW drums were temporarily managed overnight in a lined staging area located onsite. On August 12, 2019, the Public Works Department from the nearby Naval Support Activity Philadelphia transported the two drums of IDW to a secure waste management storage area. The contents of each drum were sampled by Environmental Waste Minimization, Inc. under subcontract to Thomas Environmental Services, Inc. for waste characterization profiling, transport and disposal. The drummed materials were transported for final disposal on October 10, 2019. The signed IDW manifests and disposal facility certificates of disposal are included in Appendix C.

3.5 Quality Control Sample Collection

Quality control samples were collected as follows, per the approved SAP, to ensure that procedures followed were adequate to protect sample integrity:

- A duplicate sample was shipped “blind” to the laboratory to assess laboratory precision.
- Field Equipment Rinsate Blanks were collected from the DPT rig after well installation and from groundwater sampling equipment after groundwater sample collection. The source water was laboratory supplied PFAS-free water.
- A Reagent Field Blank was collected for PFAS analysis. Source water for the field blank was PFAS-free water supplied by the laboratory along with the sample containers.
- Matrix spike and matrix-spike duplicate samples were collected to assess analytical precision and accuracy.
- A sample of the driller-supplied water used for decontamination was collected and analyzed for PFAS.

3.6 Data Review

The analytical data were reviewed as follows in accordance with the data validation procedures described in the approved SAP:

- The analytical data were checked for completeness to determine if all samples were analyzed and that results for all parameters requested on the chain-of-custody form were reported.
- The data report was checked for accuracy with respect to sample identifications, sampling locations, sampling collection dates, and concentration units.
- The data tables were organized by sampling location.
- Summary forms were checked for blank contamination and field and laboratory precision.

No significant problems affecting data usability were identified by the data review. Data review reports and associated analytical data validation reports are provided in Appendix D.

3.7 Variances to Approved Tasks

The following variances to the approved SAP and other observations occurred during the field work:

- As discussed in Section 3.1, temporary monitoring wells were able to be installed at only five of the eight proposed locations.
- Per agreement with the Navy, a sample of water used by the driller for equipment decontamination was collected and analyzed for PFAS.

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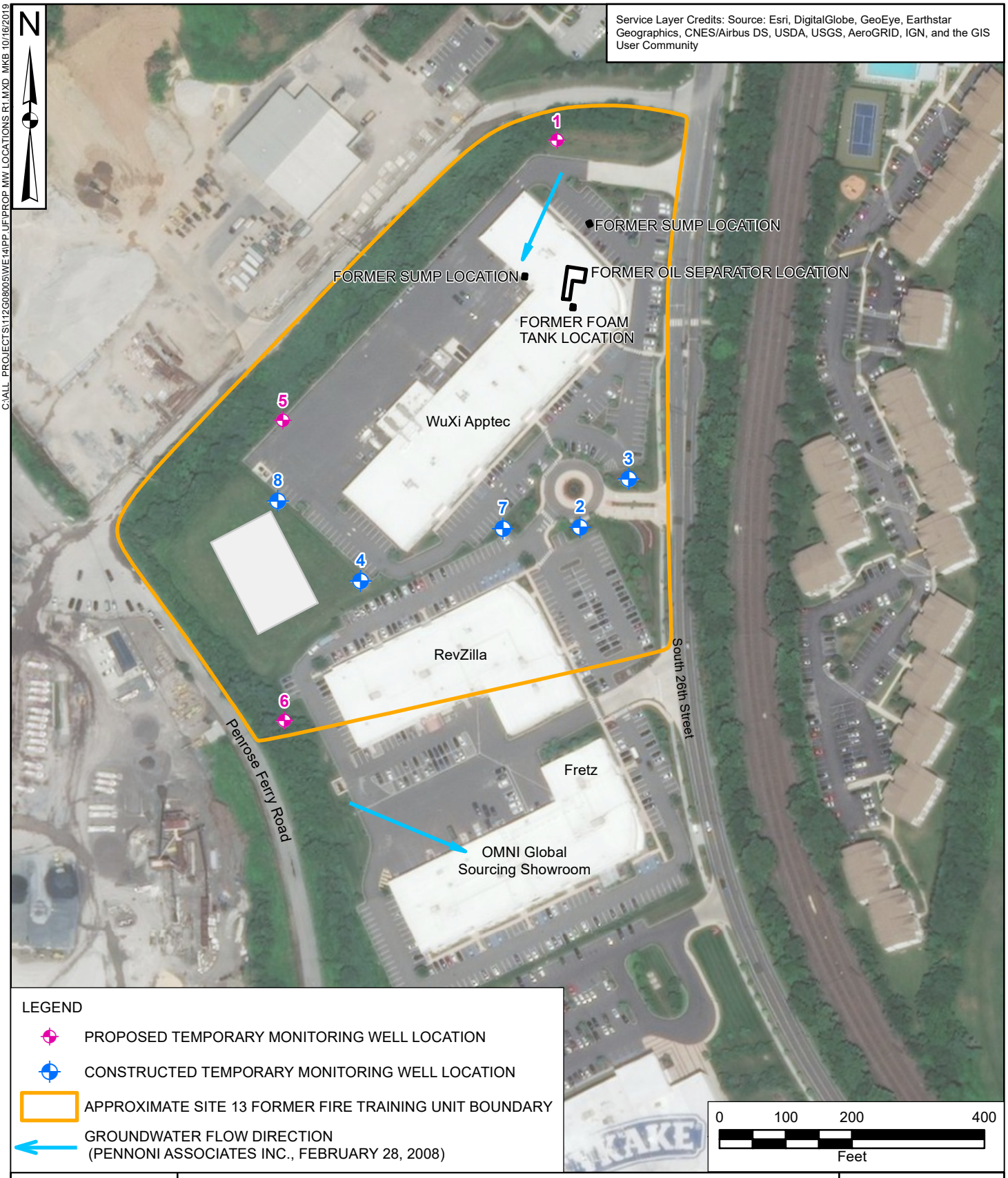

LEGEND

- PROPOSED TEMPORARY MONITORING WELL LOCATION
- CONSTRUCTED TEMPORARY MONITORING WELL LOCATION
- APPROXIMATE SITE 13 FORMER FIRE TRAINING UNIT BOUNDARY
- GROUNDWATER FLOW DIRECTION (PENNONI ASSOCIATES INC., FEBRUARY 28, 2008)

TETRA TECH

TEMPORARY MONITORING WELL LOCATIONS
FORMER FIRE TRAINING UNIT - SITE 13
FORMER NAVAL STATION PHILADELPHIA
PHILADELPHIA, PENNSYLVANIA

SCALE	PER SCALE BAR
FILE	PROP MW LOCATIONS.mxd
REV	1
DATE	10/16/19
FIGURE NUMBER	3-1

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4.0 Results and Evaluation of Data

The following subsections summarize the analytical results for samples collected during the Site 13 groundwater investigation. A complete data summary is included in Appendix E.

4.1 PFAS Screening Levels Used in Data Evaluation

Worksheet #15 of the July 2019 SAP listed the project screening level for PFBS as 400,000 ng/L per the EPA tap water Regional Screening Level (RSL) for the non-carcinogenic hazard quotient equal to 1 (HQ=1.0). However, in accordance with October 2019 DoD direction, the PFBS tap water RSL for the non-carcinogenic hazard quotient equal to 0.1 (HQ=0.1) was used for the screening level because multiple PFAS were detected in the groundwater samples (DoD, 2019).

In addition, Worksheet #15 defined the project screening levels for PFOA and PFOS as the May 2016 EPA Lifetime Health Advisory Levels established for drinking water, or 70 ng/L for each compound (USEPA, 2016a, 2016b). DoD guidance (2019) provides updated guidance for PFAS screening levels for groundwater samples collected in environmental investigations. These are EPA RSLs for tap water for a residential scenario as derived using the EPA Regional Screening Level Calculator. DoD (2019) provides an attachment table with the RSLs for PFOA, PFOS and PFBS; the screening values based on a non-carcinogenic hazard quotient equal to 0.1 (HQ=0.1) were used.

The following screening levels used in the groundwater data evaluation are summarized in the table below:

SPECIFIC PFAS	SCREENING LEVEL	REFERENCE
PFBS	40,000 ng/L	DoD (2019)[1]
PFOA	40 ng/L	DoD (2019)[1]
PFOS	40 ng/L	DoD (2019)[1]

[1] Residential Scenario Screening Levels Calculated Using EPA RSL Calculator for Tap Water as referenced in attachment table to DoD (2019) memorandum 'Investigating Per- and Polyfluoroalkyl Substances within the Department of Defense Cleanup Program'. The screening values based on a HQ of 0.1 are recommended when multiple PFAS are detected in a medium.

Samples collected from the five groundwater monitoring wells in this investigation were analyzed for the 18 specific PFAS listed in the SAP. For the purposes of this report, the discussion, tables, and figures focus on the three PFAS with screening levels shown above, per DoD guidance (2019). A complete analytical data summary is included in Appendix E. The screening levels noted above for PFOA and PFOS supersede the project screening levels as stated in the SAP.

4.2 PFAS Results

PFOA, PFOS, PFBS, and other PFAS were detected in all groundwater samples collected at Site 13 during this investigation. Table 4-1 summarizes the analytical results for PFOA, PFOS and PFBS. Figure 4-1 shows the concentrations of PFOA, PFOS, and PFBS at each sampled location. The data summary in Appendix E presents the laboratory reported validated results. The results presented in Table 4-1 and Figure 4-1 are rounded to 2 significant figures in accordance with EPA Contract Laboratory Program standards (2019a).

Concentrations of PFBS ranged from 68J to 16,000 ng/L. The PFBS RSL of 40,000 ng/L was not exceeded at any of the groundwater monitoring well locations. The maximum concentration of PFBS, detected at NSP-MW-07 (16,000 ng/L) is less than the screening level.

Concentrations of PFOA in ranged from 90 to 27,000 ng/L. All site groundwater concentrations exceeded the calculated PFOA RSL of 40 ng/L. The maximum concentration of PFOA was detected at monitoring well NSP-MW-07 (27,000 ng/L) and is two orders of magnitude greater than the next greatest PFOA concentration (290 ng/L) detected at monitoring well NSP-MW-03.

Concentrations of PFOS ranged from 120 to 1,500 ng/L. All site groundwater concentrations exceeded the calculated PFOS RSL of 40 ng/L. The maximum concentration of PFOS was detected at monitoring well NSP-MW-03.

TABLE 4-1: ANALYTICAL RESULTS[1] SUMMARY

Location:	**Project**	**NSP-MW-02**		**NSP-MW-03**		**NSP-MW-03**		**NSP-MW-04**		**NSP-MW-07**	
Sample Name:	**Screening**	**NSP-MW-02-20190812**		**NSP-MW-03-20190812**		**NSP-DUP-01-20190812**		**NSP-MW-04-20190812**		**NSP-MW-07-20190812**	
Sample Date:	**Levels**	**08/12/2019**		**08/12/2019**		**08/12/2019**		**08/12/2019**		**08/12/2019**	
Duplicate of:						**NSP-MW-03-20190812**					
PFAS		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	40	270		280		290		290		27000	
PERFLUOROOCTANESULFONIC ACID (PFOS)	40	830		1500		1300		120		910	
PERFLUOROBUTANESULFONIC ACID (PFBS)	40,000	130		140		110		68		16000	

[1] Results rounded to 2 significant figures.

TABLE 4-1: ANALYTICAL RESULTS[1] SUMMARY

Location:	Project	NSP-MW-08		QC		QC		QC	
Sample Name:	Screening	NSP-MW-08-20190812		NSP-Driller Water-20190810		NSP-FB-03-20190812		NSP-EB-01-20190812	
Sample Date:	Levels	08/12/2019		08/10/2019		08/12/2019		08/12/2019	
Duplicate of:									
PFAS		ng/L		ng/L		ng/L		ng/L	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	40	90		0.92	U	0.19	J	0.48	J
PERFLUOROOCTANESULFONIC ACID (PFOS)	40	290		0.34	U	0.44	U	0.30	J
PERFLUOROBUTANESULFONIC ACID (PFBS)	40,000	72		0.42	U	0.44	U	0.19	J

[1] Results rounded to 2 significant figures.

TABLE 4-1: ANALYTICAL RESULTS SUMMARY

Notes:
Results for groundwater samples were rounded to 2 significant figures (USEPA, 2019a). See Appendix E for a data summary of the reported analytical validated results.

Data Qualifiers:
J -- 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).
U -- The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.

Screening Levels:

PFBS -- Regional Screening Level (RSL) for Residential Tapwater
at THQ=0.1 (November 2019) (USEPA, 2019b) and DoD (2019).
PFOA - Calculated RSL for Residential Tapwater using the EPA Online Calculator with Default Input Parameters at THQ=0.1.
PFOS - Calculated RSL for Residential Tapwater using the EPA Online Calculator with Default Input Parameters at THQ=0.1.

Highlighted values exceed the associated screening level.

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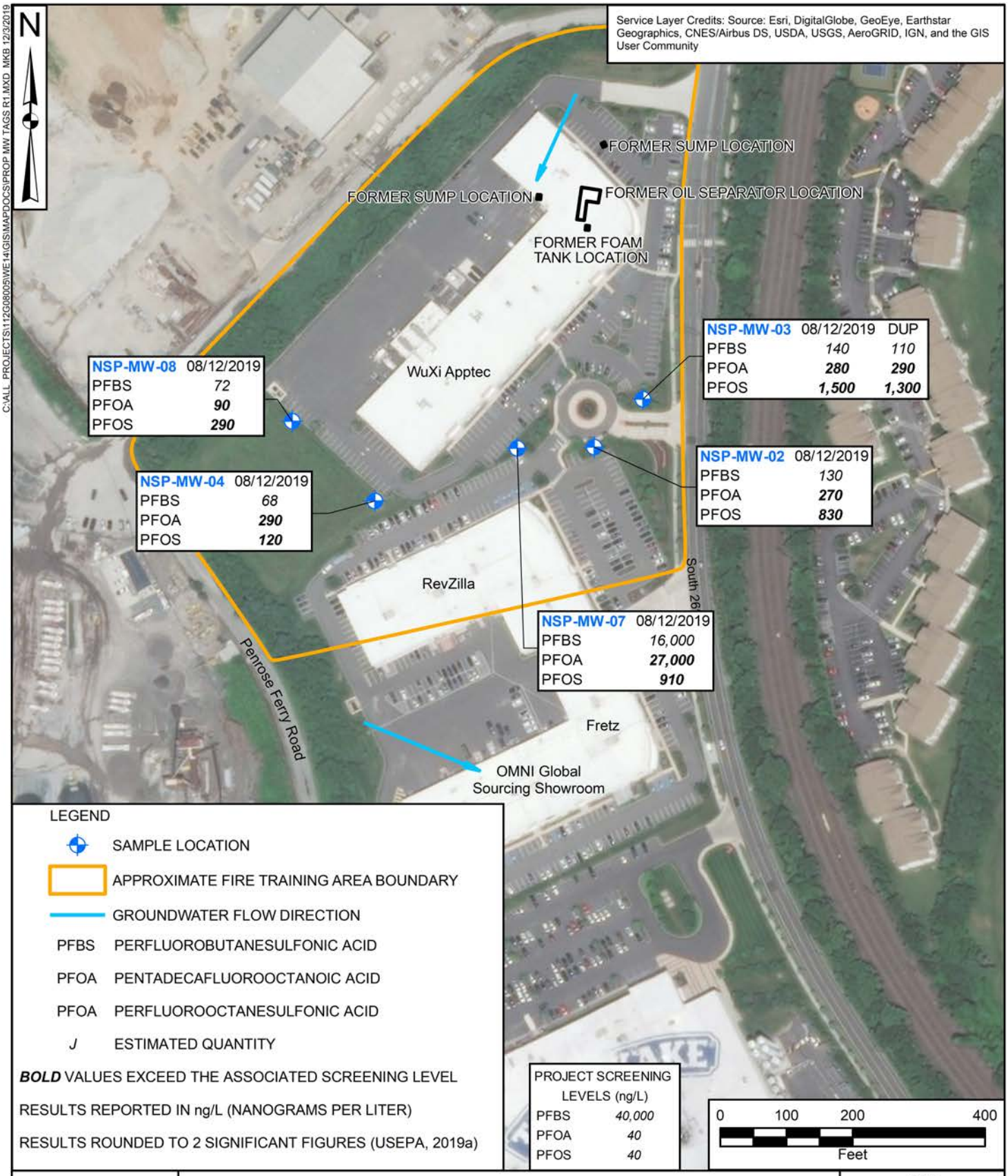

LEGEND

- SAMPLE LOCATION
- APPROXIMATE FIRE TRAINING AREA BOUNDARY
- GROUNDWATER FLOW DIRECTION
- PFBS PERFLUOROBUTANESULFONIC ACID
- PFOA PENTADECAFLUOROOCTANOIC ACID
- PFOA PERFLUOROOCTANESULFONIC ACID
- *J* ESTIMATED QUANTITY

BOLD VALUES EXCEED THE ASSOCIATED SCREENING LEVEL

RESULTS REPORTED IN ng/L (NANOGRAMS PER LITER)

RESULTS ROUNDED TO 2 SIGNIFICANT FIGURES (USEPA, 2019a)

PROJECT SCREENING LEVELS (ng/L)	
PFBS	*40,000*
PFOA	*40*
PFOS	*40*

TETRA TECH

GROUNDWATER SAMPLING RESULTS
FORMER FIRE TRAINING UNIT
FORMER NAVAL STATION
PHILADELPHIA, PENNSYLVANIA

SCALE	
PER SCALE BAR	
FILE	
PROP MW LOCATIONS.mxd	
REV	DATE
1	12/03/19
FIGURE NUMBER	
4-1	

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5.0 Conclusions and Recommendations

5.1 Conclusions

The purpose of this groundwater investigation was to assess whether PFAS are present in shallow groundwater at Site 13 at concentrations of PFBS in excess of the applicable tap water risk based RSL, or the applicable values calculated using the EPA online RSL calculator for PFOA and PFOS, all based on a HQ=0.1. Based on sampling results, PFAS contamination is present in shallow groundwater at the FFTU. Groundwater samples collected from all five temporary wells had PFOA and PFOS concentrations above their calculated screening levels. As shown on Figure 4-1, concentrations of PFOA, PFOS and PFBS are greater in the southeastern portion of the FFTU. However, as previously discussed in Section 2.5, current exposure via the drinking water pathway is not complete, because LUCs are in place to restrict the use of site groundwater for such purpose.

5.2 Recommendations

The decision rule in the approved SAP for this groundwater investigation states that if the PFOA, PFOS, or PFBS concentration in any groundwater sample exceeds the applicable screening level (or RSL as summarized above in Section 4.1), then convene the project team to determine what additional measures are needed to delineate the extent of contamination and to determine if data gaps exist. Because PFOA and PFOS were detected in site groundwater at concentrations exceeding their respective screening levels, a follow-up investigation to delineate the extent of PFAS at the site may be warranted; however, the Navy has established LUCs for the Site that prevent the use of site groundwater for drinking water, and therefore current exposure through this pathway is incomplete.

A Preliminary Assessment is being prepared for the remaining transferred Navy property at Philadelphia Naval Business Center (PNBC). The scope of additional investigations at this site will be addressed in the resulting SI work plan.

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6.0 References

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APPENDIX A
TEMPORARY GROUNDWATER MONITORING WELL LOGS

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TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720DT Geoprobe

BORING No.: SB-2
DATE: 8-11-2019
GEOLOGIST: Seth Oshier
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
SB1	1					Brown	Silty-sand with gravel + cobble		Dry	0.0
@	2		45"/			Gray				0.0
1255	3		/60"			Gray-Black				0.0
	4									0.0
	5									0.0
	6									0.0
SB2	7		50"/				Sandy-silt		Wet	0.0
@	8		/60"			Black				0.0
1301	9						Clayey-silt			0.0
	10					Black				10.8
	11					Black	Clayey-silt		Wet	14.8
SB3	12		56"/							47.1
@ 1305	13		/60"							16.3
	14									21.4
	15									48.3
SB4	16					Black	Silty-clay		Wet	51.4
@	17		46"/							62.8
1310	18		/60"							9.4
	19								Moist	3.5
	20					Brown	Sandy-silt with peat			2.1
	21					Black	Sandy-silt		Wet	0.0
	22		51"/							0.0
	23		/60"							0.0
	24					Brown	Med sand with gravel			0.0
	25									0.0

* When rock coring, enter rock brokeness.

Remarks:

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720 DT Geoprobe

BORING No.: SB-2 continued
DATE: 8-11-2019
GEOLOGIST: Seth Oshir
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
SB6	26						Medium sand with gravel		Wet	0.0
@	27						↓			0.0
1327										

* When rock coring, enter rock brokeness.

Remarks: GPS Coordinates: 389564.03 ft N, 297327.68 ft E

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720 DT Geoprobe

BORING No.: SB-3
DATE: 8-11-2019
GEOLOGIST: Seth Oshier
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
	1					Brown	Silty-sand with concrete brick + gravel		Dry	0.0
	2					↓	↓		↓	0.0
SB1 @	3		53½/60"			↓	↓		↓	0.0
1122	4					Gray	↓		↓	0.0
	5					↓	↓		↓	0.0
	6					Gray	Sandy-silt with gravel		Dry	0.0
SB2	7					↓	↓		↓	0.0
@	8		33½/60"			↓	↓		↓	0.0
1126	9					Gray Black	Silt-ly with trace clay		Wet	53.1
	10					↓	↓		Wet, slight sheen	61.3
	11					Black	Clay - silt; small layer of medium sand		Saturated	2.1
SB3	12		50½/60"			Black	Silty-clay		Wet	6.8
@	13					↓	↓		↓	18.3
1130	14					↓	↓		↓	10.1
	15					↓	↓		↓ slight petrol odor	59.4
	16					Black	Sandy-silt		Wet	14.6
SB4	17					↓	↓		↓	17.2
@ 1145	18		55½/60"			↓	Silty-clay		↓	2.1
	19					↓	↓		↓	1.8
	20					↓	Sandy-silt; Peat		↓	0.5
SB5	21					Black	Sandy-silt		Wet	17.1
@	22		60½/60"			↓	↓		↓	18.3
1157	23					↓	↓		↓	6.2
	24					Brown	Silt		↓	0.6
	25					Brown	Fine sand with some med sand		↓	0.3

* When rock coring, enter rock brokeness.

Remarks:

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7/20 DT Geoprobe

BORING No.: SB-3 continued
DATE: 8-11-2019
GEOLOGIST: Seth Oshior
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
SB6	26					Brown	Medium to fine sand w/ gravel		Saturated	0.0
@	27					↓	↓		↓	0.0
1210	28									0.0
	29									0.0
	30									0.0

* When rock coring, enter rock brokeness.

Remarks: GPS Coordinates: 389651.44 ft N, 297388.97 ft E

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720DT Geoprobe

BORING No.: SB-4
DATE: 8/16-11/2019
GEOLOGIST: Seth Oshier
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
	1					Brown	Top soil; silty-sand w/ gravel; concrete fragments		Dry	0.0
SB1	2		55"/			↓	↓		↓	0.0
@ 1130	3		60"							0.0
	4					↓	↓		↓	0.0
	5					Lt brown grey	Fine sand w/ gravel		Dry	0.0
	6					Grey	Silty sand w/ gravel & brick		Dry	0.0
SB2	7		60"/			↓	↓		↓	0.0
@ 1145	8		60"							0.0
	9					↓	↓		↓	0.0
	10			- - -		Brown	Silty-clay		↓	0.0
	11					Brown	Sandy-silt		Wet	19.9
SB-3	12		49"/			Brown	Silty-clay		Wet	32.8
@ 745	13		60"			Black	Silty clay		Wet; Slight odor	63.1
	14					↓	↓		↓	50.1
	15					↓	↓		↓	40.5
SB4	16					Br-Bl	Sandy-silt		Wet	16.5
@	17		50"/			Bl	Silty-clay		Wet slight petroleum odor	33.8
755	18		60"				↓			38.5
	19									22.4
	20						↓			21.6
	21					Black	Sandy-silt w/ some clay		Wet	26.1
SB-5	22		60"/				↓		↓	28.2
@	23						Sandy-silt		Wet	21.3
810	24		60	- - -			↓		↓	7.6
	25						Silty-sand		Wet	10.3

* When rock coring, enter rock brokeness.

Remarks:

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720DT Geoprobe

BORING No.: SB-4 continued
DATE: 8/11/2014
GEOLOGIST: Seth Oshrer
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
	26					Gray Brown	Silty- sand		Saturated	1.0
SB6	27					Brown	Fine sand, some gravel		↓	0.7
@	28		56"/			↓	↓		↓	0.3
520	29		/60"						Wet	
	30					↓	Silty- fine sand		↓	

* When rock coring, enter rock brokeness.

Remarks: GPS Coordinates: 389493.09 ft N, 297006.18 ft E

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: Geoprobe

BORING No.: SB-7
DATE: 8-10-19
GEOLOGIST:
DRILLER:

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
	1					Br	Sandy silt w/ some gravel	SM	Dry	0.0
S-1 @	2		46"/60"				some concrete			0.0
1038	3					Black/Brown	Silty sand w/ gravel, concrete, brick fragments	SM	Dry	0.0
	4									0.0
	5									0.0
	6					Brown	Silty sand w/ brick + mica	SM	Dry	0.0
S-2	7		36"/60"			Black	Sandy silt		Wet	14.8
@ 1045	8					Black	Silty-clay	ML/CL	Wet; petroleum odor	50.4
	9									70.2
	10									62.4
	11									
S-3	12		0"/60"				No recovery			
@ 1049	13									
	14									
	15									
	16					Black	Sandy-silt	SM	Saturated	1.3
S-4	17		48"/60"			Black	Silty-clay		Saturated	53.8
@ 1055	18					Grey	Silty-clay w/ organics		Saturated	68.6
	19									2.1
	20					Grey	Peat with organics/wood		Wet	0.0
S-5	21					Grey	Sandy-silt	SM	Saturated	0.0
@	22		49"/60"							0.0
1104	23					Brown	Fine sand	SM	Saturated	0.0
	24									0.0
	25									0.0

* When rock coring, enter rock brokeness.

Remarks: GPS Coordinates: 389578.91 ft N 297208.71 ft E

Converted to Well: Yes _____ No _____ Well I.D. #: _____

TETRA TECH

BORING LOG

PROJECT NAME: Philadelphia Navy Yard
PROJECT NUMBER: 112G08005-WE14
DRILLING COMPANY: TWS
DRILLING RIG: 7720 DT Geoprobe

BORING No.: SB-8
DATE: 8-11-2019
GEOLOGIST: Seth Oshier
DRILLER: Shane

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID
	1					Br	Top soil, medium sand		Dry	0.0
SB1	2		48"/			Br	Silty-sand w/ concrete + gravel		Dry	0.0
@	3		60"			↓	↓		↓	0.0
922	4					↓	↓		↓	0.0
	5					Black	↓		Dry	0.0
	6					Black	Silty-sand		Moist	0.0
SB2	7		60"/			↓	↓		Wet	1.2
@ 928	8		60"			↓	↓		↓	4.9
	9					Black	Sandy-silt		Wet; slight	15.1
	10					↓	↓		↓ petrol odor	16.2
	11					Black	Sandy-silt		Saturated	9.4
SB3	12					Black	Silt		Saturated	1.3
@	13		60"/			↓	↓		↓	1.6
931	14		60"			↓	↓		↓	8.0
	15					↓	↓		↓	6.3
	16					Black	Silt w/ trace clay		Saturated	0.4
SB4	17		60"/			↓	Silt		↓	12.5
@ 936	18		60"			↓	↓		↓	40.3
	19					↓	↓		Wet	4.7
	20					Brown	Fine to medium sand		↓	0.0
	21					Brown	↓		Saturated	
SB5	22					↓	↓		↓	
@ 946	23		45"/			↓	Medium sand w/ gravel		Wet; poorly sorted	
	24		60			↓	↓		↓	
	25					↓	↓		↓	

* When rock coring, enter rock brokeness.

Remarks: GPS Coordinates: 389637.36 Ft N, 296857.33 FE

Converted to Well: Yes _____ No _____ Well I.D. #: _____

APPENDIX B
GROUNDWATER SAMPLE LOG SHEETS

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GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Groundwater Sampling
Project Site Name:	Philadelphia Navy Yard
Project No.:	112G08005-WE14

Sample ID: NSP-MW-02-20190812	**Sampled By:** SCO
QA/QC Duplicate ID: —	**Sample Date:** 8-12-2019
MS/MSD Collected: YES (NO)	**Sample Time:** 1215

WELL INFORMATION:

Well ID : MW-02	**Purge Date:** 8-12-2019
Well Diameter (in): 1	**Static Water Level (ft-BTOR):** 12.21
Top of Screen (ft-BTOR): 22.5	**PID Monitor Reading:** 3.1
Bottom of Screen (ft-BTOR): 27.5	**Purge Method:** Low flow
Total Well Depth (ft-BTOR): 27.5	**Sample Method:** Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52	**Pump Controller:** Solinist Peristaltic Pump
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_20 Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1120	12.21	250	Dark Br.	6.82	1.14	3.09	7000	21.97	-34	—	—
1125	12.21	250	Brown	6.79	1.04	6.77	>1000	18.94	-42	—	—
1130	12.21	250	Lt brown	6.72	1.04	5.50	890	19.53	-50	—	—
1135	12.21	250	Gray	6.73	1.03	5.09	661	19.57	-55	—	—
1140	12.21	250	Gray	6.73	1.03	4.60	356	19.38	-61	—	—
1145	12.21	250	Lt gray	6.72	1.03	4.09	265	19.30	-63	—	—
1150	12.21	250	Lt gray	6.72	1.03	3.61	254	19.21	-66	—	—
1155	12.21	250	"	6.72	1.02	3.21	163	19.24	-68	—	—
1200	12.21	250	"	6.73	1.02	3.04	152	19.28	-69	—	—
1205	12.21	250	Lt gr. tint	6.73	1.02	2.61	44.6	19.16	-74	—	—
1210	12.21	250	"	6.74	1.02	2.40	40.3	19.20	-72	—	—
1215	12.21	250	"	6.74	1.02	2.45	41.2	19.09	-74	—	—

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1120	1215	55	3.25	6.74	1.02	2.45	41.2	19.09	-74	—	—

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	PFAS by LCMSMS Compliant with QSM 5.1.1 Table B-15	None	250	mL	HDPE	2

OBSERVATIONS / NOTES:

Slight petroleum odor

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Groundwater Sampling
Project Site Name:	Philadelphia Navy Yard
Project No.:	112G08005-WE14

Sample ID: NSP-MW-03-20190812	Sampled By: SCO
QA/QC Duplicate ID: NSP-DUP-01-20190812	Sample Date: 8-12-2019
MS/MSD Collected: YES (NO) @1200	Sample Time: 1100

WELL INFORMATION:

Well ID: MW-03	Purge Date: 8-12-2019
Well Diameter (in): 1	Static Water Level (ft-BTOR): 12.72
Top of Screen (ft-BTOR): 23.5	PID Monitor Reading: 0.7 ppm
Bottom of Screen (ft-BTOR): 28.5	Purge Method: Low flow
Total Well Depth (ft-BTOR): 28.5	Sample Method: Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52	Pump Controller: Solinist Peristaltic Pump
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1010	12.72	200	Brown	6.84	1.26	1.36	>1000	21.71	-53	–	–
1015	12.72	200	"	6.69	1.04	0.81	>1000	19.74	-56	–	–
1020	12.72	200	Lt brown	6.66	1.04	0.64	>1000	19.16	-58	–	–
1025	12.72	200	"	6.64	1.04	0.31	>1000	18.60	-61	–	–
1030	12.72	200	"	6.64	1.06	0.08	>1000	18.49	-65	–	–
1035	12.72	250	Gray	6.64	1.06	0.00	892	18.38	-67	–	–
1040	12.72	250	Lt gray	6.63	1.05	0.00	675	18.21	-69	–	–
1045	12.72	250	"	6.63	1.05	0.00	640	18.40	-70	–	–
1050	12.72	250	"	6.63	1.05	0.00	638	18.51	-72	–	–
1055	12.72	250	"	6.62	1.05	0.00	650	18.50	-71	–	–
1100	12.72	250	"	6.62	1.04	0.00	641	18.49	-72	–	–

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1010	1100	50	3.5	6.62	1.04	0.00	641	18.49	-72	–	–

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	PFAS by LCMSMS Compliant with QSM 5.1.1 Table B-15	None	250	mL	HDPE	2

OBSERVATIONS / NOTES:

Slight perloleum odor; NSP-FB-03-20190812 Field Blank collected at location

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Groundwater Sampling
Project Site Name:	Philadelphia Navy Yard
Project No.:	112G08005-WE14

Sample ID: NPS-MW-04-20190812	**Sampled By:** CM
QA/QC Duplicate ID: N/A	**Sample Date:** 8/12/19
MS/MSD Collected: (YES) NO	**Sample Time:** 0940
WELL INFORMATION:	
Well ID : NPS-MW-04	**Purge Date:** 8/12/19
Well Diameter (in): 1"	**Static Water Level (ft-BTOR):** 14.35
Top of Screen (ft-BTOR): 20	**PID Monitor Reading:** 0.3 ppm
Bottom of Screen (ft-BTOR): 30	**Purge Method:** Low flow
Total Well Depth (ft-BTOR): 30	**Sample Method:** Low flow
EQUIPMENT INFORMATION:	
Water Quality Instrument: Horiba U-52	**Pump Controller:** Solinist Peristaltic Pump
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0835	14.35	200	DKBrn	6.91	2.03	0.00	>1000	18.19	-121	—	—
0840	14.35	200	DKBrn	6.85	2.06	0.00	>1000	17.42	-127	—	—
0845	14.35	200	DKBrn	6.76	2.06	0.00	>1000	16.98	-124	—	—
0850	14.35	200	DKBrn	6.76	2.04	0.00	>1000	17.19	-120	—	—
0855	14.35	200	DKBrn	6.72	2.03	0.00	>1000	17.36	-118	—	—
0900	14.35	200	Brown	6.70	1.98	0.00	>1000	18.11	-116	—	—
0905	14.35	200	Brown	6.69	1.96	0.00	>1000	18.48	-111	—	—
0910	14.35	200	Brown	6.69	1.95	0.00	>1000	19.07	-111	—	—
0915	14.35	200	Brown	6.69	1.93	0.00	>1000	19.45	-111	—	—
0920	14.35	200	Brown	6.69	1.93	0.00	>1000	19.17	-110	—	—
0925	14.35	200	Brown	6.69	1.92	0.00	>1000	19.34	-111	—	—
0930	14.35	200	Brown	6.69	1.90	0.00	>1000	19.19	-110	—	—
0935	14.35	200	Brown	6.68	1.94	0.00	>1000	18.94	-109	—	—

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal.) L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0835	0935	60	3.0	6.68	1.94	0.00	>1000	18.94	-109	—	—

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	PFAS by LCMSMS Compliant with QSM 5.1.1 Table B-15	None	250	mL	HDPE	6

OBSERVATIONS / NOTES:

Lighter Brown with no odor or sheen observed

Coordinates:	N	E	Signature(s):
			[signature]

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Groundwater Sampling
Project Site Name:	Philadelphia Navy Yard
Project No.:	112G08005-WE14

Sample ID: NSP-MW-07-20190812	**Sampled By:** SCO
QA/QC Duplicate ID: —	**Sample Date:** 8-11-2019
MS/MSD Collected: YES (NO)	**Sample Time:** 0935

WELL INFORMATION:

Well ID : MW-07	**Purge Date:** 8-11-2019
Well Diameter (in): 1	**Static Water Level (ft-BTOR):** 13.2
Top of Screen (ft-BTOR): 19.5'	**PID Monitor Reading:** 4.8
Bottom of Screen (ft-BTOR): 24.5'	**Purge Method:** Low flow
Total Well Depth (ft-BTOR): 24.5'	**Sample Method:** Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52	**Pump Controller:** Solinist Peristaltic Pump
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0835	13.20	250	Brown	6.71	2.59	1.22	>1000	19.63	-37	-	-
0840	13.20	250	"	6.88	2.84	0.39	"	17.76	-71	-	-
0845	13.20	250	"	6.92	2.78	0.36	"	18.48	-89	-	-
0850	13.20	250	"	6.93	2.77	0.25	"	19.06	-93	-	-
0855	13.20	250	"	6.94	2.81	0.08	"	19.36	-98	-	-
0900	13.20	250	"	6.94	2.85	0.00	"	19.31	-104	-	-
0905	13.20	250	Lt br	6.93	2.91	0.00	"	19.30	-106	-	-
0910	13.20	250	"	6.93	2.93	0.00	"	19.24	-107	-	-
0915	13.20	250	"	6.90	2.97	0.00	"	19.15	-108	-	-
0920	13.20	250	"	6.88	2.99	0.00	"	18.99	-107	-	-
0925	13.20	250	"	6.87	3.01	0.00	"	18.98	-106	-	-
0930	13.20	250	"	6.88	3.01	0.00	"	18.95	-105	-	-
0935	13.20	250	Lt br.	6.88	3.01	0.00	>1000	18.94	-104	-	-

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
0835	0935	60	2.5	6.88	3.01	0.00	>1000	18.94	-104	-	-

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	PFAS by LCMSMS Compliant with QSM 5.1.1 Table B-15	None	250	mL	HDPE	2

OBSERVATIONS / NOTES:

Slight petroleum odor

Coordinates:	N	E	Signature(s):

GROUNDWATER SAMPLE LOG SHEET

TETRA TECH

Event:	Groundwater Sampling
Project Site Name:	Philadelphia Navy Yard
Project No.:	112G08005-WE14

Sample ID: NPS-MW-08-20190812	**Sampled By:** CM
QA/QC Duplicate ID: N/A	**Sample Date:** 8/12/19
MS/MSD Collected: YES (NO)	**Sample Time:** 1115

WELL INFORMATION:

Well ID : NPS-MW-08	**Purge Date:** 8/12/19
Well Diameter (in): 1" PVC	**Static Water Level (ft-BTOR):** 12.10
Top of Screen (ft-BTOR):	**PID Monitor Reading:** 6.7 ppm
Bottom of Screen (ft-BTOR):	**Purge Method:** Low flow
Total Well Depth (ft-BTOR):	**Sample Method:** Low flow

EQUIPMENT INFORMATION:

Water Quality Instrument: Horiba U-52	**Pump Controller:** Solinist Peristaltic Pump
Turbidity Meter: Hach 2100Q	

PURGE DATA:

Time (Hrs)	H_2O Level (ft-BTOR)	Flow mL / min.	Color	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1025	12.10	200	Black	6.79	1.53	0.00	>1000	17.69	-79	—	—
1030	12.49	200	Dk Brn	6.78	1.50	0.00	>1000	17.63	-80	—	—
1035	12.57	200	Lt Brn	6.79	1.47	0.00	795	17.47	-80	—	—
1040	12.63	200	Lt Brn	6.78	1.44	0.00	371	17.34	-79	—	—
1045	12.66	200	Lt Brn	6.77	1.42	0.00	199	17.29	-79	—	—
1050	12.68	200	Lt Brn	6.79	1.38	0.00	247	17.28	-81	—	—
1055	12.70	200	Lt Brn	6.77	1.38	0.00	225	17.29	-78	—	—
1100	12.70	200	Lt Brn	6.75	1.37	0.00	166	17.16	-76	—	—
1105	12.70	200	Lt Brn	6.75	1.36	0.00	185	17.18	-75	—	—
1110	12.71	200	Lt Brn	6.77	1.34	0.00	183	17.29	-77	—	—

FINAL PURGE / SAMPLE DATA:

Start Purge	End Purge	Total (min.)	Total Vol. (gal. / L.)	pH (S.U.)	S.C. (mS/cm)	DO (mg/L)	Turbidity (NTU)	Temp. (C°)	ORP (mV)	Salinity (% or ppt)	Other
1025	1110	45	2.5	6.77	1.34	0.00	183	17.29	-77	—	—

Analysis	Method	Preservative	Number	Vol.	Bottle Type	Collected
PFAS	PFAS by LCMSMS Compliant with QSM 5.1.1 Table B-15	None	250	mL	HDPE	2

OBSERVATIONS / NOTES:

Water light brown with a petroleum odor no sheen noted

Coordinates:	N	E	Signature(s):
			[signature]

Tetra Tech, Inc.

QA SAMPLE LOG SHEET

Project Site Name: Naval Station Phila
Sample ID Number: NSP-EB-01-20190812
Project Number: 112G08005-WE14
Sampled By: SCO
Sample Location: MW-04
C.O.C. Number:
QA: Sample Type:

[ ] Trip Blank
[ ] Source Water Blank
[ ] Rinsate Blank
[X] Other Blank Equipment Blank

SAMPLING DATA:

Date: 8/12/2019
Time: 0945
Method: Grab

WATER SOURCE:

[X] Laboratory Prepared
[ ] Purchased
[ ] Other
[ ] Tap
[ ] Fire Hydrant

PURCHASED WATER INFORMATION (If Applicable as Source or Rinsate Water):

Product Name:
Supplier:
Manufacturer:
Order Number:
Lot Number:
Expiration Date:

RINSATE INFORMATION (If Applicable):

Media Type: Water
Equipment Used: Silicon Tubing
Equipment Type:
[X] Dedicated
[ ] Reusable

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
PFAS	None	250 mL HDPE	2

OBSERVATIONS / NOTES:

Signature(s):

APPENDIX C
INVESTIGATION-DERIVED WASTE PAPERWORK

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NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number: PA4 170 022 41
2. Page 1 of 1
3. Emergency Response Phone: (877) 460-1038
4. Waste Tracking Number: 101619HOR-1

5. Generator's Name and Mailing Address: NAVFAC BRAC PROGRAM
4911 SOUTH BROAD STREET
PHILADELPHIA, PA 19112
Generator's Phone: (215) 897-4904

Generator's Site Address (if different than mailing address)
4000 SOUTH 26TH STREET
PHILADELPHIA, PA 19112

6. Transporter 1 Company Name: HORWITH TRUCKS, INC.
U.S. EPA ID Number: PAD 146 714 878

7. Transporter 2 Company Name: EQ INDUSTRIAL SERVICES
U.S. EPA ID Number: MIK035642742

8. Designated Facility Name and Site Address: MICHIGAN DISPOSAL WASTE TREATMEN
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489
U.S. EPA ID Number: MID 000 724 831

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
	NON-REGULATED LIQUID MATERIAL	001	DM	00300	P	029L PFAS
	2.					
	3.					
	4.					

13. Special Handling Instructions and Additional Information
01. I190133MDI / IDW Waste- PFAS Liquids
manifested MDI materia on WDI manifest in error. ok to print,sign and date new manifest per Michael DeHaven.

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Duane Price
Signature:
Month Day Year: 10 16 19

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Dale Gorr
Signature:
Month Day Year: 10 16 19

Transporter 2 Printed/Typed Name: Ethan Hubbard
Signature:
Month Day Year: 10 17 19

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

H110

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Adrian DiPascale
Signature:
Month Day Year: 10 21 19

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

169-BLC-O 5 11977 (Rev. 9/09)

DESIGNATED FACILITY TO GENERATOR

CERTIFICATE OF DISPOSAL

US ecology

This certificate is to verify the wastes specified on Manifest # 101619HOR-1

have been properly disposed of in accordance with all local, state and federal regulation.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40CFR et sea.

FACILITY NAME: (Please check one)

☒ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☐ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Bellville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-593-5329

Authorized Signature: _____

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Please print or type.

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: PA4170022410

2. Page 1 of 3

3. Emergency Response Phone: Rapid Response Inc. 877-460-3038

4. Manifest Tracking Number: 013796599 FLE

GENERATOR

5. Generator's Name and Mailing Address
NAVFAC BRAC
4911 S. Broad St.
Philadelphia, PA 19112
Generator's Phone: 215-897-4904

Generator's Site Address (if different than mailing address)
NAVFAC BRAC Program MGT Office East
4000 South 26th St
Philadelphia, PA 19112

6. Transporter 1 Company Name: Environmental Waste Minimization, Inc.
U.S. EPA ID Number: PAR000501577

7. Transporter 2 Company Name: Horwith Trucks Inc
U.S. EPA ID Number: PAD146719878

8. Designated Facility Name and Site Address
Wayne Disposal Site #2 Landfill
49350 N. I-94 Service Dr.
Belleville, MI 48111
Facility's Phone: 800-592-5489
U.S. EPA ID Number: MID048090633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
	1. ~~Non-Hazardous Liquids, DOT/RCRA Non-Regulated~~	~~001~~	~~DM~~	~~300~~	~~P~~	~~D001~~		
	2. Non-Hazardous Solids, DOT/RCRA Non-Regulated	001	DM	500	P			
	3.							
	4.							

14. Special Handling Instructions and Additional Information
Document # D266876 114890
~~1.) Approval #: I190133MDI ; ERG # IDW WASTE - PFAS LIQUIDS (1x55)~~
2.) Approval #: I190132WDI-OTS ; ERG # IDW WASTE - PFAS SOLIDS (1x55
T-155

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Michael J Kilpatrick
Signature: M. Kilpatrick
Month 10 Day 10 Year 19

INT'L

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Brian Ohl
Signature: B. Ohl
Month 10 Day 10 Year 19

Transporter 2 Printed/Typed Name: Peter G Zarayko
Signature: Peter G. Zarayko
Month 10 Day 10 Year 19

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☒ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
See 8, 10, 11, 12, 13 Ok to separate Section 1 per Jackie Thomas on 10-24-19
OK to give Civil Law a manifest per Michael Johnson
Manifest Reference Number: 101619HOR-1

18b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator)
Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
H132			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Chris Gruber
Signature:
Month 10 Day 24 Year 19

EPA Form 8700-22 (Rev. 12-17) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

CERTIFICATE OF DISPOSAL

US ecology

This certificate is to verify the wastes specified on Manifest # 013796599FLE

have been properly disposed of in accordance with all local, state and federal regulation.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40CFR et sea.

FACILITY NAME: (Please check one)

☐ Michigan Disposal Waste Treatment Plant (EPA I.D. # MID000724831)

☒ Wayne Disposal, Inc. (EPA I.D. # MID048090633)

ADDRESS: 49350 N. I-94 Service Drive
Bellville, Michigan 48111

PHONE NUMBER: 1-800-592-5489

FAX NUMBER: 1-800-593-5329

Authorized Signature: _____

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APPENDIX D
ANALYTICAL DATA VALIDATION REPORTS

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TETRA TECH **INTERNAL CORRESPONDENCE**

TO:	**M. MANG**	**DATE:**	**SEPTEMBER 18, 2019**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION –POLYFLUOROALKYL SUBSTANCES (PFAS)**
NAVAL STATION PHILADELPHIA
PHILADELPHIA, PENNSYLVANIA
SAMPLE DELIVERY GROUP (SDG) 19-0746

SAMPLES: 7/Groundwater

NSP-Driller Water-2019081
NSP-MW-02-20190812
NSP-MW-04-20190812
NSP-MW-08-20190812
NSP-DUP-01-20190812
NSP-MW-03-20190812
NSP-MW-07-20190812

1/Equipment Blank

NSP-EB-01-20190812

1/Field Blank

NSP-FB-03-20190812

Overview

The sample set for Naval Satation Philadelphia, SDG 19-0746, consisted of seven (7) groundwater samples, one (1) equipment blank and one (1) field blank. All samples were analyzed for perfluorinated alkyl acids including pentadecafluorooctanoic acid (PFOA), perfluorobutane sulfonic acid (PFBS), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluorooctane sulfonic acid (PFOS), 11CL-PF3OUdS, 4,8-dioxa-3h-perfluorononanoic acid (ADONA), 9CL-PF3ONS, hexafluoropropylene oxide dimer acid (HFPO-DA), N-ethylperfluorooctane sulfonamidoacetate (NEFOSA), N-methylperfluorooctane sulfonamidoacetate (NMFOSA), perfluorodecanoic acid (PFDA), perfluorododecanoic acid (PFDoA), perffluorohexanoic acid (PFHxA), perfluorotetradecanoic acid (PFTeA), perfluorotridecanoic acid (PFTriA) and perfluoroundecanoic acid (PFUnA). One (1) field duplicate pair, NSP-MW-03-20190812 / NSP-DUP-01-20190812 was associated with this SDG.

The samples were collected by Tetra Tech, Inc. on August 12 and 20, 2019 and analyzed by Battelle Laboratory. All analyses were conducted in accordance with Department of Defense ((DOD)/Department of Energy (DOE) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1.1, PFAS using LC/MS/MS Appendix B Table B-15 (February 2018).

The data contained in this SDG was validated via 80% EPA Stage 2B and 20% EPA Stage 3 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 instrument/preparation/field blank results, extraction internal standard recoveries, laboratory control sample results, injected internal standard areas and recoveries, matrix spike / matrix spike duplicate recoveries, field duplicate precision, compound identification, compound quantitation, and detection limits. Areas of concern are listed below.

Major

No issues.

Minor

Detected results reported below the limit of quantitation (LOQ) but above the detection limit (DL) were qualified as estimated (J).

The following compounds were detected in the preparation/field blanks at concentrations < 1/2 the LOQ.

Compound	Concentration	Action Level LOQ > or <
PFOS[1]	1.86 ng/L	< LOQ
PFOA[2]	0.48 ng/L	< LOQ
PFBS[2]	0.19 ng/L	< LOQ
PFHxS[2]	0.57 ng/L	< LOQ
PFHxA[2]	0.78 ng/L	< LOQ

[1] Maximum concentration present in the preparation blank affecting all groundwater samples.
[2] Maximum concentration present in the equipment blank affecting all groundwater samples.

The detected results reported below the LOQ were qualified as nondetected (U) and raised to the limit of detection (LOD) if required. Field and equipment blanks are not qualified for blank contamination.

The matrix spike / matrix spike duplicate (MS/MSD) percent recoveries for PFHxA were above the quality control limit for sample NSP-MW-04-20190812. The detected result reported for PFHxA in the affected sample was qualified as estimated (J).

The MS percent recovery for PFOS was below the quality control limit for sample NSP-MW-04-20190812. The MSD percent recovery was within quality control limits. The detected result reported for PFOS in the affected sample was qualified as estimated (J).

The MSD percent recovery for PFHpA was below 10% for sample NSP-MW-04-20190812. The MS percent recovery was within quality control limits. The detected result reported for PFHpA in the affected sample was qualified as estimated (J).

The MS/MSD relative percent differences for PFHpA, PFBS and PFOS were outside the quality control limits for sample NSP-MW-04-20190812. The detected results reported for PFHpA, PFBS and PFOS in the affected sample were qualified as estimated (J).

Notes

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

The following samples were analyzed at a dilution.

Sample	Compound	Dilution
NSP-DUP-01-20190812	PFOA	10X
	PFHpA	10X
	PFHxS	20X
	PFHxA	10X
	PFNA	10X
	PFOS	40X
NSP-MW-02-20190812	PFOA	16.66X

	PFHpA	16.66X
	PFHxS	16.66X
	PFHxA	16.66X
	PFNA	16.66X
	PFOS	16.66X
NSP-MW-03-20190812	PFOA	10X
	PFHpA	10X
	PFHxS	25X
	PFHxA	10X
	PFNA	10X
	PFOS	25X
NSP-MW-04-20190812	PFOA	5X
	PFBS	5X
	PFHpA	5X
	PFHxS	5X
	PFHxA	50X
	PFNA	5X
	PFOS	5X
NSP-MW-07-20190812	PFOA	625X
	PFBS	250X
	PFHpA	625X
	PFHxS	3125X
	PFHxA	3125X
	PFOS	25X
NSP-MW-08-20190812	PFOA	10X
	PFHxS	10X
	PFHxA	10X
	PFOS	10X

The laboratory uses a primary transition for the quantitation of a compound and a secondary transition for confirmation.

The continuing calibration verification on 09/03/2019 at 16:24 had percent recoveries for PFHxA on the primary and secondary columns above the 130% quality control limit. No validation actions were required as no results for PFHXA were affected.

The results for PFHxS and the surrogate percent recoveries for 13C3-PFHxS were checked and verified in samples NSP-MW-07-20190812 and NSP-MW-04-20190812. The laboratory checked and verified the sample result for PFOS for sample NSP-MW-02-20190812. The results for PFOA for samples NSP-DUP-01-20190812 and NSP-MW-08-20190812 were checked and verified using a linear regression for the initial calibration.

Executive Summary

Laboratory Performance: Blank contamination was present in the preparation/field blanks.

Other Factors Affecting Data Quality: Results below the LOQ were estimated. Four MS/MSD percent recoveries and relative percent differences were outside the quality control limits.

The data for these analyses were reviewed with reference to the Environmental Protection Agency (EPA) document 910-R-18-001 “Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFAS) Analyzed using EPA 537” (November 2018), and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", Version 5.1.1, Appendix B Table B-15 (February 2018). The text of this report has been formulated to address only those areas affecting data quality.

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

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.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.
J	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).
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported detection limit is approximate and may be inaccurate or imprecise.
NJ	The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
R	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.
UR	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.
X	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 x 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

PROJ_NO: 08005-WE14	NSAMPLE	NSP-Driller Water-2019081			NSP-DUP-01-20190812			NSP-EB-01-20190812			NSP-FB-03-20190812		
SDG: 19-0746	LAB_ID	I6203-FS			I6202-FS			I6205-FS			I6204-FS		
FRACTION: PFAS	SAMP_DATE	8/20/2019			8/12/2019			8/12/2019			8/12/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF				NSP-MW-03-20190812								
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		0.39	U		0.38	U		0.35	U		0.35	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.39	U		0.38	U		0.35	U		0.35	U	
9CL-PF3ONS		0.39	U		0.38	U		0.35	U		0.35	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		0.37	J	P	2.51	J	P	0.35	U		0.35	U	
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		0.98	U		0.94	U		0.88	U		0.88	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.96	U		1.89	U		1.75	U		1.75	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		0.92	U	B	293.17			0.48	J	P	0.19	J	P
PERFLUOROBUTANESULFONIC ACID (PFBS)		0.49	U	B	105.77			0.19	J	P	0.44	U	
PERFLUORODECANOIC ACID (PFDA)		0.49	U		7.24			0.44	U		0.44	U	
PERFLUORODODECANOIC ACID (PFDOA)		0.49	U		0.47	U		0.44	U		0.44	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		0.49	U		146.13			0.44	U		0.44	U	
PERFLUOROHEXANESULFONIC ACID (PFHXS)		1.18	U	B	547.78			0.57	J	P	0.35	U	
PERFLUOROHEXANOIC ACID (PFHXA)		1.8	U	B	278.06			0.78	J	P	0.44	U	
PERFLUORONONANOIC ACID (PFNA)		0.98	U		96.79			0.88	U		0.88	U	
PERFLUOROOCTANESULFONIC ACID (PFOS)		0.49	U	A	1252.9			0.3	J	P	0.44	U	
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.98	U		0.94	U		0.88	U		0.88	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.49	U		0.47	U		0.44	U		0.44	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.98	U		0.72	J	P	0.88	U		0.88	U	

PROJ_NO: 08005-WE14	NSAMPLE	NSP-MW-02-20190812			NSP-MW-03-20190812			NSP-MW-04-20190812			NSP-MW-07-20190812		
SDG: 19-0746	LAB_ID	I6197-FS			I6198-FS			I6199-FS			I6200-FS		
FRACTION: PFAS	SAMP_DATE	8/12/2019			8/12/2019			8/12/2019			8/12/2019		
MEDIA: WATER	QC_TYPE	NM			NM			NM			NM		
	UNITS	NG/L			NG/L			NG/L			NG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
11CL-PF3OUDS		0.38	U		0.39	U		0.37	U		0.38	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.38	U		0.39	U		0.37	U		0.38	U	
9CL-PF3ONS		0.38	U		0.39	U		0.37	U		0.38	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		1.9	J	P	2.7	J	P	3.35	J	P	2.06	J	P
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		0.96	U		0.98	U		0.93	U		0.96	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.92	U		1.96	U		1.85	U		1.92	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		271.08			282.81			285.08			26922.24		
PERFLUOROBUTANESULFONIC ACID (PFBS)		126.83			140.75			68.3	J	D	15784.56		
PERFLUORODECANOIC ACID (PFDA)		9.93			9			1.07	J	P	0.44	J	P
PERFLUORODODECANOIC ACID (PFDOA)		0.48	U		0.49	U		0.46	U		0.48	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		108.11			144.16			211.01	J	D	6952.67		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		423.36			609.4			336.54			48171.51		
PERFLUOROHEXANOIC ACID (PFHXA)		272.64			267.51			263.28	J	D	72221.27		
PERFLUORONONANOIC ACID (PFNA)		82.31			99.03			142.34			25.85		
PERFLUOROOCTANESULFONIC ACID (PFOS)		833.54			1513.8			118.31	J	D	910.79		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.96	U		0.98	U		0.93	U		0.96	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.48	U		0.49	U		0.46	U		0.48	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		2.8	J	P	1.06	J	P	0.93	U		0.96	U	

PROJ_NO: 08005-WE14	NSAMPLE	NSP-MW-08-20190812		
SDG: 19-0746	LAB_ID	I6201-FS		
FRACTION: PFAS	SAMP_DATE	8/12/2019		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	NG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
11CL-PF3OUDS		0.36	U	
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.36	U	
9CL-PF3ONS		0.36	U	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		1.69	J	P
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NEFOSA)		0.89	U	
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE(NMFOSA)		1.79	U	
PENTADECAFLUOROOCTANOIC ACID (PFOA)		90.4		
PERFLUOROBUTANESULFONIC ACID (PFBS)		71.78		
PERFLUORODECANOIC ACID (PFDA)		1.27	J	P
PERFLUORODODECANOIC ACID (PFDOA)		0.45	U	
PERFLUOROHEPTANOIC ACID (PFHPA)		106.36		
PERFLUOROHEXANESULFONIC ACID (PFHXS)		188.46		
PERFLUOROHEXANOIC ACID (PFHXA)		182.32		
PERFLUORONONANOIC ACID (PFNA)		48.42		
PERFLUOROOCTANESULFONIC ACID (PFOS)		285.24		
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.89	U	
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.45	U	
PERFLUOROUNDECANOIC ACID (PFUNA)		0.89	U	

Appendix B

Results as Reported by the Laboratory

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-02-20190812
Battelle ID	I6197-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.260
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	272.64	D	I6197-FS-D(3)	16.667	9/1/2019	3.04	8.01	80.13
PFHpA	375-85-9	108.11	D	I6197-FS-D(3)	16.667	9/1/2019	2.56	8.01	80.13
PFOA	335-67-1	271.08	D	I6197-FS-D(3)	16.667	9/1/2019	2.88	8.01	80.13
PFNA	375-95-1	82.31	D	I6197-FS-D(3)	16.667	9/1/2019	4.17	16.03	80.13
PFDA	335-76-2	9.93		I6197-FS(0)	1.000	9/1/2019	0.15	0.48	4.81
PFUnA	2058-94-8	2.80	J	I6197-FS(0)	1.000	9/1/2019	0.28	0.96	4.81
PFDoA	307-55-1	0.48	U	I6197-FS(0)	1.000	9/1/2019	0.17	0.48	4.81
PFTrDA	72629-94-8	0.48	U	I6197-FS(0)	1.000	9/1/2019	0.14	0.48	4.81
PFTeDA	376-06-7	0.96	U	I6197-FS(0)	1.000	9/1/2019	0.24	0.96	4.81
NMeFOSAA	2355-31-9	1.92	U	I6197-FS(0)	1.000	9/1/2019	0.54	1.92	4.81
NEtFOSAA	2991-50-6	0.96	U	I6197-FS(0)	1.000	9/1/2019	0.47	0.96	4.81
PFBS	375-73-5	126.83		I6197-FS(0)	1.000	9/1/2019	0.13	0.48	4.81
PFHxS	355-46-4	423.36	D	I6197-FS-D(3)	16.667	9/1/2019	1.76	6.41	80.13
PFOS	1763-23-1	833.54	D	I6197-FS-D(3)	16.667	9/1/2019	3.04	8.01	80.13
HFPO-DA	13252-13-6	1.90	J	I6197-FS(0)	1.000	9/1/2019	0.19	0.38	4.81
Adona	919005-14-4	0.38	U	I6197-FS(0)	1.000	9/1/2019	0.17	0.38	4.81
11Cl-PF3OUdS	763051-92-9	0.38	U	I6197-FS(0)	1.000	9/1/2019	0.17	0.38	4.81
9Cl-PF3ONS	756426-58-1	0.38	U	I6197-FS(0)	1.000	9/1/2019	0.10	0.38	4.81

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-02-20190812
Battelle ID	I6197-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	90	D	I6197-FS-D(3)	9/1/2019
13C4-PFHpA	95	D	I6197-FS-D(3)	9/1/2019
13C8-PFOA	93	D	I6197-FS-D(3)	9/1/2019
13C9-PFNA	91	D	I6197-FS-D(3)	9/1/2019
13C6-PFDA	66		I6197-FS(0)	9/1/2019
13C7-PFUnA	73		I6197-FS(0)	9/1/2019
13C2-PFDoA	77		I6197-FS(0)	9/1/2019
13C2-PFTeDA	83		I6197-FS(0)	9/1/2019
d3-MeFOSAA	96	D	I6197-FS-D(3)	9/1/2019
d5-EtFOSAA	90	D	I6197-FS-D(3)	9/1/2019
13C3-PFBS	103	D	I6197-FS-D(3)	9/1/2019
13C3-PFHxS	108	D	I6197-FS-D(3)	9/1/2019
13C8-PFOS	93	D	I6197-FS-D(3)	9/1/2019
13C3-HFPO-DA	79	D	I6197-FS-D(3)	9/1/2019

BATTELLE
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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-03-20190812
Battelle ID	I6198-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.255
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	267.51	D	I6198-FS-D(3)	10.000	9/1/2019	1.86	4.90	49.02
PFHpA	375-85-9	144.16	D	I6198-FS-D(3)	10.000	9/1/2019	1.57	4.90	49.02
PFOA	335-67-1	282.81	D	I6198-FS-D(3)	10.000	9/1/2019	1.76	4.90	49.02
PFNA	375-95-1	99.03	D	I6198-FS-D(3)	10.000	9/1/2019	2.55	9.80	49.02
PFDA	335-76-2	9.00		I6198-FS(0)	1.000	9/1/2019	0.16	0.49	4.90
PFUnA	2058-94-8	1.06	J	I6198-FS(0)	1.000	9/1/2019	0.28	0.98	4.90
PFDoA	307-55-1	0.49	U	I6198-FS(0)	1.000	9/1/2019	0.18	0.49	4.90
PFTrDA	72629-94-8	0.49	U	I6198-FS(0)	1.000	9/1/2019	0.15	0.49	4.90
PFTeDA	376-06-7	0.98	U	I6198-FS(0)	1.000	9/1/2019	0.25	0.98	4.90
NMeFOSAA	2355-31-9	1.96	U	I6198-FS(0)	1.000	9/1/2019	0.55	1.96	4.90
NEtFOSAA	2991-50-6	0.98	U	I6198-FS(0)	1.000	9/1/2019	0.48	0.98	4.90
PFBS	375-73-5	140.75		I6198-FS(0)	1.000	9/1/2019	0.13	0.49	4.90
PFHxS	355-46-4	609.40	D	I6198-FS-D(5)	25.000	9/1/2019	2.70	9.80	122.55
PFOS	1763-23-1	1513.80	D	I6198-FS-D(5)	25.000	9/1/2019	4.66	12.25	122.55
HFPO-DA	13252-13-6	2.70	J	I6198-FS(0)	1.000	9/1/2019	0.20	0.39	4.90
Adona	919005-14-4	0.39	U	I6198-FS(0)	1.000	9/1/2019	0.18	0.39	4.90
11Cl-PF3OUdS	763051-92-9	0.39	U	I6198-FS(0)	1.000	9/1/2019	0.18	0.39	4.90
9Cl-PF3ONS	756426-58-1	0.39	U	I6198-FS(0)	1.000	9/1/2019	0.10	0.39	4.90

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-03-20190812
Battelle ID	I6198-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	80	D	I6198-FS-D(3)	9/1/2019
13C4-PFHpA	85	D	I6198-FS-D(3)	9/1/2019
13C8-PFOA	86	D	I6198-FS-D(3)	9/1/2019
13C9-PFNA	77	D	I6198-FS-D(3)	9/1/2019
13C6-PFDA	64		I6198-FS(0)	9/1/2019
13C7-PFUnA	70		I6198-FS(0)	9/1/2019
13C2-PFDoA	69		I6198-FS(0)	9/1/2019
13C2-PFTeDA	74		I6198-FS(0)	9/1/2019
d3-MeFOSAA	108	D	I6198-FS-D(5)	9/1/2019
d5-EtFOSAA	120	D	I6198-FS-D(5)	9/1/2019
13C3-PFBS	125	D	I6198-FS-D(5)	9/1/2019
13C3-PFHxS	130	D	I6198-FS-D(5)	9/1/2019
13C8-PFOS	103	D	I6198-FS-D(5)	9/1/2019
13C3-HFPO-DA	70	D	I6198-FS-D(3)	9/1/2019

BATTELLE
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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-04-20190812
Battelle ID	I6199-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.270
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	263.28	D	I6199-FS-D(3)	50.000	9/1/2019	8.80	23.15	231.48
PFHpA	375-85-9	211.01	D	I6199-FS-D(11)	5.000	9/3/2019	0.74	2.31	23.15
PFOA	335-67-1	285.08	D	I6199-FS-D(11)	5.000	9/3/2019	0.83	2.31	23.15
PFNA	375-95-1	142.34	D	I6199-FS-D(11)	5.000	9/3/2019	1.20	4.63	23.15
PFDA	335-76-2	1.07	J	I6199-FS(0)	1.000	9/1/2019	0.15	0.46	4.63
PFUnA	2058-94-8	0.93	U	I6199-FS(0)	1.000	9/1/2019	0.27	0.93	4.63
PFDoA	307-55-1	0.46	U	I6199-FS(0)	1.000	9/1/2019	0.17	0.46	4.63
PFTrDA	72629-94-8	0.46	U	I6199-FS(0)	1.000	9/1/2019	0.14	0.46	4.63
PFTeDA	376-06-7	0.93	U	I6199-FS(0)	1.000	9/1/2019	0.23	0.93	4.63
NMeFOSAA	2355-31-9	1.85	U	I6199-FS(0)	1.000	9/1/2019	0.52	1.85	4.63
NEtFOSAA	2991-50-6	0.93	U	I6199-FS(0)	1.000	9/1/2019	0.45	0.93	4.63
PFBS	375-73-5	68.30	D	I6199-FS-D(11)	5.000	9/3/2019	0.60	2.31	23.15
PFHxS	355-46-4	336.54	D	I6199-FS-D(11)	5.000	9/3/2019	0.51	1.85	23.15
PFOS	1763-23-1	118.31	D	I6199-FS-D(11)	5.000	9/3/2019	0.88	2.31	23.15
HFPO-DA	13252-13-6	3.35	J	I6199-FS(0)	1.000	9/1/2019	0.19	0.37	4.63
Adona	919005-14-4	0.37	U	I6199-FS(0)	1.000	9/1/2019	0.17	0.37	4.63
11Cl-PF3OUdS	763051-92-9	0.37	U	I6199-FS(0)	1.000	9/1/2019	0.17	0.37	4.63
9Cl-PF3ONS	756426-58-1	0.37	U	I6199-FS(0)	1.000	9/1/2019	0.09	0.37	4.63

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-04-20190812
Battelle ID	I6199-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	62	D	I6199-FS-D(11)	9/3/2019
13C4-PFHpA	61	D	I6199-FS-D(11)	9/3/2019
13C8-PFOA	68	D	I6199-FS-D(11)	9/3/2019
13C9-PFNA	68	D	I6199-FS-D(11)	9/3/2019
13C6-PFDA	75		I6199-FS(0)	9/1/2019
13C7-PFUnA	80		I6199-FS(0)	9/1/2019
13C2-PFDoA	86		I6199-FS(0)	9/1/2019
13C2-PFTeDA	92		I6199-FS(0)	9/1/2019
d3-MeFOSAA	51	D	I6199-FS-D(11)	9/3/2019
d5-EtFOSAA	65	D	I6199-FS-D(11)	9/3/2019
13C3-PFBS	59	D	I6199-FS-D(11)	9/3/2019
13C3-PFHxS	75	D	I6199-FS-D(11)	9/3/2019
13C8-PFOS	62	D	I6199-FS-D(11)	9/3/2019
13C3-HFPO-DA	53	D	I6199-FS-D(11)	9/3/2019

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-07-20190812
Battelle ID	I6200-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.260
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	72221.27	D	I6200-FS-D(13)	3125.000	9/4/2019	570.91	1502.40	15024.04
PFHpA	375-85-9	6952.67	D	I6200-FS-D(11)	625.000	9/4/2019	96.15	300.48	3004.81
PFOA	335-67-1	26922.24	D	I6200-FS-D(11)	625.000	9/4/2019	108.17	300.48	3004.81
PFNA	375-95-1	25.85		I6200-FS(0)	1.000	9/1/2019	0.25	0.96	4.81
PFDA	335-76-2	0.44	J	I6200-FS(0)	1.000	9/1/2019	0.15	0.48	4.81
PFUnA	2058-94-8	0.96	U	I6200-FS(0)	1.000	9/1/2019	0.28	0.96	4.81
PFDoA	307-55-1	0.48	U	I6200-FS(0)	1.000	9/1/2019	0.17	0.48	4.81
PFTrDA	72629-94-8	0.48	U	I6200-FS(0)	1.000	9/1/2019	0.14	0.48	4.81
PFTeDA	376-06-7	0.96	U	I6200-FS(0)	1.000	9/1/2019	0.24	0.96	4.81
NMeFOSAA	2355-31-9	1.92	U	I6200-FS(0)	1.000	9/1/2019	0.54	1.92	4.81
NEtFOSAA	2991-50-6	0.96	U	I6200-FS(0)	1.000	9/1/2019	0.47	0.96	4.81
PFBS	375-73-5	15784.56	D	I6200-FS-D(9)	250.000	9/4/2019	31.25	120.19	1201.92
PFHxS	355-46-4	48171.51	D	I6200-FS-D(13)	3125.000	9/4/2019	330.53	1201.92	15024.04
PFOS	1763-23-1	910.79	D	I6200-FS-D(7)	25.000	9/3/2019	4.57	12.02	120.19
HFPO-DA	13252-13-6	2.06	J	I6200-FS(0)	1.000	9/1/2019	0.19	0.38	4.81
Adona	919005-14-4	0.38	U	I6200-FS(0)	1.000	9/1/2019	0.17	0.38	4.81
11Cl-PF3OUdS	763051-92-9	0.38	U	I6200-FS(0)	1.000	9/1/2019	0.17	0.38	4.81
9Cl-PF3ONS	756426-58-1	0.38	U	I6200-FS(0)	1.000	9/1/2019	0.10	0.38	4.81

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-07-20190812
Battelle ID	I6200-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	107	D	I6200-FS-D(11)	9/4/2019
13C4-PFHpA	107	D	I6200-FS-D(11)	9/4/2019
13C8-PFOA	105	D	I6200-FS-D(11)	9/4/2019
13C9-PFNA	108	D	I6200-FS-D(11)	9/4/2019
13C6-PFDA	69		I6200-FS(0)	9/1/2019
13C7-PFUnA	89		I6200-FS(0)	9/1/2019
13C2-PFDoA	103		I6200-FS(0)	9/1/2019
13C2-PFTeDA	113		I6200-FS(0)	9/1/2019
d3-MeFOSAA	69	D	I6200-FS-D(7)	9/3/2019
d5-EtFOSAA	69	D	I6200-FS-D(7)	9/3/2019
13C3-PFBS	70	D	I6200-FS-D(7)	9/3/2019
13C3-PFHxS	69	D	I6200-FS-D(7)	9/3/2019
13C8-PFOS	70	D	I6200-FS-D(7)	9/3/2019
13C3-HFPO-DA	104	D	I6200-FS-D(11)	9/4/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-08-20190812
Battelle ID	I6201-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.280
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	182.32	D	I6201-FS-D(3)	10.000	9/1/2019	1.70	4.46	44.64
PFHpA	375-85-9	106.36		I6201-FS(0)	1.000	9/1/2019	0.14	0.45	4.46
PFOA	335-67-1	90.40	D	I6201-FS-D(3)	10.000	9/1/2019	1.61	4.46	44.64
PFNA	375-95-1	48.42		I6201-FS(0)	1.000	9/1/2019	0.23	0.89	4.46
PFDA	335-76-2	1.27	J	I6201-FS(0)	1.000	9/1/2019	0.14	0.45	4.46
PFUnA	2058-94-8	0.89	U	I6201-FS(0)	1.000	9/1/2019	0.26	0.89	4.46
PFDoA	307-55-1	0.45	U	I6201-FS(0)	1.000	9/1/2019	0.16	0.45	4.46
PFTrDA	72629-94-8	0.45	U	I6201-FS(0)	1.000	9/1/2019	0.13	0.45	4.46
PFTeDA	376-06-7	0.89	U	I6201-FS(0)	1.000	9/1/2019	0.22	0.89	4.46
NMeFOSAA	2355-31-9	1.79	U	I6201-FS(0)	1.000	9/1/2019	0.50	1.79	4.46
NEtFOSAA	2991-50-6	0.89	U	I6201-FS(0)	1.000	9/1/2019	0.44	0.89	4.46
PFBS	375-73-5	71.78		I6201-FS(0)	1.000	9/1/2019	0.12	0.45	4.46
PFHxS	355-46-4	188.46	D	I6201-FS-D(3)	10.000	9/1/2019	0.98	3.57	44.64
PFOS	1763-23-1	285.24	D	I6201-FS-D(3)	10.000	9/1/2019	1.70	4.46	44.64
HFPO-DA	13252-13-6	1.69	J	I6201-FS(0)	1.000	9/1/2019	0.18	0.36	4.46
Adona	919005-14-4	0.36	U	I6201-FS(0)	1.000	9/1/2019	0.16	0.36	4.46
11Cl-PF3OUdS	763051-92-9	0.36	U	I6201-FS(0)	1.000	9/1/2019	0.16	0.36	4.46
9Cl-PF3ONS	756426-58-1	0.36	U	I6201-FS(0)	1.000	9/1/2019	0.09	0.36	4.46

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-MW-08-20190812
Battelle ID	I6201-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	79	D	I6201-FS-D(3)	9/1/2019
13C4-PFHpA	90	D	I6201-FS-D(3)	9/1/2019
13C8-PFOA	91	D	I6201-FS-D(3)	9/1/2019
13C9-PFNA	83	D	I6201-FS-D(3)	9/1/2019
13C6-PFDA	70		I6201-FS(0)	9/1/2019
13C7-PFUnA	74		I6201-FS(0)	9/1/2019
13C2-PFDoA	76		I6201-FS(0)	9/1/2019
13C2-PFTeDA	82		I6201-FS(0)	9/1/2019
d3-MeFOSAA	88	D	I6201-FS-D(3)	9/1/2019
d5-EtFOSAA	89	D	I6201-FS-D(3)	9/1/2019
13C3-PFBS	89	D	I6201-FS-D(3)	9/1/2019
13C3-PFHxS	90	D	I6201-FS-D(3)	9/1/2019
13C8-PFOS	81	D	I6201-FS-D(3)	9/1/2019
13C3-HFPO-DA	73	D	I6201-FS-D(3)	9/1/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-DUP-01-20190812
Battelle ID	I6202-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.265
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	278.06	D	I6202-FS-D(3)	10.000	9/1/2019	1.79	4.72	47.17
PFHpA	375-85-9	146.13	D	I6202-FS-D(3)	10.000	9/1/2019	1.51	4.72	47.17
PFOA	335-67-1	293.17	D	I6202-FS-D(3)	10.000	9/1/2019	1.70	4.72	47.17
PFNA	375-95-1	96.79	D	I6202-FS-D(3)	10.000	9/1/2019	2.45	9.43	47.17
PFDA	335-76-2	7.24		I6202-FS(0)	1.000	9/1/2019	0.15	0.47	4.72
PFUnA	2058-94-8	0.72	J	I6202-FS(0)	1.000	9/1/2019	0.27	0.94	4.72
PFDoA	307-55-1	0.47	U	I6202-FS(0)	1.000	9/1/2019	0.17	0.47	4.72
PFTrDA	72629-94-8	0.47	U	I6202-FS(0)	1.000	9/1/2019	0.14	0.47	4.72
PFTeDA	376-06-7	0.94	U	I6202-FS(0)	1.000	9/1/2019	0.24	0.94	4.72
NMeFOSAA	2355-31-9	1.89	U	I6202-FS(0)	1.000	9/1/2019	0.53	1.89	4.72
NEtFOSAA	2991-50-6	0.94	U	I6202-FS(0)	1.000	9/1/2019	0.46	0.94	4.72
PFBS	375-73-5	105.77		I6202-FS(0)	1.000	9/1/2019	0.12	0.47	4.72
PFHxS	355-46-4	547.78	D	I6202-FS-D(5)	20.000	9/1/2019	2.08	7.55	94.34
PFOS	1763-23-1	1252.90	D	I6202-FS-D(7)	40.000	9/1/2019	7.17	18.87	188.68
HFPO-DA	13252-13-6	2.51	J	I6202-FS(0)	1.000	9/1/2019	0.19	0.38	4.72
Adona	919005-14-4	0.38	U	I6202-FS(0)	1.000	9/1/2019	0.17	0.38	4.72
11Cl-PF3OUdS	763051-92-9	0.38	U	I6202-FS(0)	1.000	9/1/2019	0.17	0.38	4.72
9Cl-PF3ONS	756426-58-1	0.38	U	I6202-FS(0)	1.000	9/1/2019	0.09	0.38	4.72

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-DUP-01-20190812
Battelle ID	I6202-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	83	D	I6202-FS-D(3)	9/1/2019
13C4-PFHpA	89	D	I6202-FS-D(3)	9/1/2019
13C8-PFOA	95	D	I6202-FS-D(3)	9/1/2019
13C9-PFNA	85	D	I6202-FS-D(3)	9/1/2019
13C6-PFDA	78		I6202-FS(0)	9/1/2019
13C7-PFUnA	78		I6202-FS(0)	9/1/2019
13C2-PFDoA	84		I6202-FS(0)	9/1/2019
13C2-PFTeDA	91		I6202-FS(0)	9/1/2019
d3-MeFOSAA	85	D	I6202-FS-D(7)	9/1/2019
d5-EtFOSAA	98	D	I6202-FS-D(7)	9/1/2019
13C3-PFBS	102	D	I6202-FS-D(7)	9/1/2019
13C3-PFHxS	113	D	I6202-FS-D(7)	9/1/2019
13C8-PFOS	93	D	I6202-FS-D(7)	9/1/2019
13C3-HFPO-DA	76	D	I6202-FS-D(3)	9/1/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-Driller Water-20190810
Battelle ID	I6203-FS
Sample Type	SA
Collection Date	08/10/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	GW
Sample Size	0.255
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	1.80	J	I6203-FS(0)	1.000	9/1/2019	0.19	0.49	4.90
PFHpA	375-85-9	0.49	U	I6203-FS(0)	1.000	9/1/2019	0.16	0.49	4.90
PFOA	335-67-1	0.92	J	I6203-FS(0)	1.000	9/1/2019	0.18	0.49	4.90
PFNA	375-95-1	0.98	U	I6203-FS(0)	1.000	9/1/2019	0.25	0.98	4.90
PFDA	335-76-2	0.49	U	I6203-FS(0)	1.000	9/1/2019	0.16	0.49	4.90
PFUnA	2058-94-8	0.98	U	I6203-FS(0)	1.000	9/1/2019	0.28	0.98	4.90
PFDoA	307-55-1	0.49	U	I6203-FS(0)	1.000	9/1/2019	0.18	0.49	4.90
PFTrDA	72629-94-8	0.49	U	I6203-FS(0)	1.000	9/1/2019	0.15	0.49	4.90
PFTeDA	376-06-7	0.98	U	I6203-FS(0)	1.000	9/1/2019	0.25	0.98	4.90
NMeFOSAA	2355-31-9	1.96	U	I6203-FS(0)	1.000	9/1/2019	0.55	1.96	4.90
NEtFOSAA	2991-50-6	0.98	U	I6203-FS(0)	1.000	9/1/2019	0.48	0.98	4.90
PFBS	375-73-5	0.42	J	I6203-FS(0)	1.000	9/1/2019	0.13	0.49	4.90
PFHxS	355-46-4	1.18	J	I6203-FS(0)	1.000	9/1/2019	0.11	0.39	4.90
PFOS	1763-23-1	0.34	J	I6203-FS(0)	1.000	9/1/2019	0.19	0.49	4.90
HFPO-DA	13252-13-6	0.37	J	I6203-FS(0)	1.000	9/1/2019	0.20	0.39	4.90
Adona	919005-14-4	0.39	U	I6203-FS(0)	1.000	9/1/2019	0.18	0.39	4.90
11Cl-PF3OUdS	763051-92-9	0.39	U	I6203-FS(0)	1.000	9/1/2019	0.18	0.39	4.90
9Cl-PF3ONS	756426-58-1	0.39	U	I6203-FS(0)	1.000	9/1/2019	0.10	0.39	4.90

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-Driller Water-20190810
Battelle ID	I6203-FS
Sample Type	SA
Collection Date	08/10/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	60	I6203-FS(0)	9/1/2019
13C4-PFHpA	60	I6203-FS(0)	9/1/2019
13C8-PFOA	60	I6203-FS(0)	9/1/2019
13C9-PFNA	59	I6203-FS(0)	9/1/2019
13C6-PFDA	73	I6203-FS(0)	9/1/2019
13C7-PFUnA	74	I6203-FS(0)	9/1/2019
13C2-PFDoA	71	I6203-FS(0)	9/1/2019
13C2-PFTeDA	78	I6203-FS(0)	9/1/2019
d3-MeFOSAA	71	I6203-FS(0)	9/1/2019
d5-EtFOSAA	71	I6203-FS(0)	9/1/2019
13C3-PFBS	82	I6203-FS(0)	9/1/2019
13C3-PFHxS	75	I6203-FS(0)	9/1/2019
13C8-PFOS	69	I6203-FS(0)	9/1/2019
13C3-HFPO-DA	55	I6203-FS(0)	9/1/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-FB-03-20190812
Battelle ID	I6204-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	FB
Sample Size	0.285
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.17	0.44	4.39
PFHpA	375-85-9	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.14	0.44	4.39
PFOA	335-67-1	0.19	J	I6204-FS(0)	1.000	9/2/2019	0.16	0.44	4.39
PFNA	375-95-1	0.88	U	I6204-FS(0)	1.000	9/2/2019	0.23	0.88	4.39
PFDA	335-76-2	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.14	0.44	4.39
PFUnA	2058-94-8	0.88	U	I6204-FS(0)	1.000	9/2/2019	0.25	0.88	4.39
PFDoA	307-55-1	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.16	0.44	4.39
PFTrDA	72629-94-8	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.13	0.44	4.39
PFTeDA	376-06-7	0.88	U	I6204-FS(0)	1.000	9/2/2019	0.22	0.88	4.39
NMeFOSAA	2355-31-9	1.75	U	I6204-FS(0)	1.000	9/2/2019	0.49	1.75	4.39
NEtFOSAA	2991-50-6	0.88	U	I6204-FS(0)	1.000	9/2/2019	0.43	0.88	4.39
PFBS	375-73-5	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.11	0.44	4.39
PFHxS	355-46-4	0.35	U	I6204-FS(0)	1.000	9/2/2019	0.10	0.35	4.39
PFOS	1763-23-1	0.44	U	I6204-FS(0)	1.000	9/2/2019	0.17	0.44	4.39
HFPO-DA	13252-13-6	0.35	U	I6204-FS(0)	1.000	9/2/2019	0.18	0.35	4.39
Adona	919005-14-4	0.35	U	I6204-FS(0)	1.000	9/2/2019	0.16	0.35	4.39
11Cl-PF3OUdS	763051-92-9	0.35	U	I6204-FS(0)	1.000	9/2/2019	0.16	0.35	4.39
9Cl-PF3ONS	756426-58-1	0.35	U	I6204-FS(0)	1.000	9/2/2019	0.09	0.35	4.39

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-FB-03-20190812
Battelle ID	I6204-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	59	I6204-FS(0)	9/2/2019
13C4-PFHpA	63	I6204-FS(0)	9/2/2019
13C8-PFOA	63	I6204-FS(0)	9/2/2019
13C9-PFNA	52	I6204-FS(0)	9/2/2019
13C6-PFDA	65	I6204-FS(0)	9/2/2019
13C7-PFUnA	73	I6204-FS(0)	9/2/2019
13C2-PFDoA	66	I6204-FS(0)	9/2/2019
13C2-PFTeDA	64	I6204-FS(0)	9/2/2019
d3-MeFOSAA	86	I6204-FS(0)	9/2/2019
d5-EtFOSAA	77	I6204-FS(0)	9/2/2019
13C3-PFBS	77	I6204-FS(0)	9/2/2019
13C3-PFHxS	83	I6204-FS(0)	9/2/2019
13C8-PFOS	75	I6204-FS(0)	9/2/2019
13C3-HFPO-DA	52	I6204-FS(0)	9/2/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-EB-01-20190812
Battelle ID	I6205-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	EB
Sample Size	0.285
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.78	J	I6205-FS(0)	1.000	9/1/2019	0.17	0.44	4.39
PFHpA	375-85-9	0.44	U	I6205-FS(0)	1.000	9/1/2019	0.14	0.44	4.39
PFOA	335-67-1	0.48	J	I6205-FS(0)	1.000	9/1/2019	0.16	0.44	4.39
PFNA	375-95-1	0.88	U	I6205-FS(0)	1.000	9/1/2019	0.23	0.88	4.39
PFDA	335-76-2	0.44	U	I6205-FS(0)	1.000	9/1/2019	0.14	0.44	4.39
PFUnA	2058-94-8	0.88	U	I6205-FS(0)	1.000	9/1/2019	0.25	0.88	4.39
PFDoA	307-55-1	0.44	U	I6205-FS(0)	1.000	9/1/2019	0.16	0.44	4.39
PFTrDA	72629-94-8	0.44	U	I6205-FS(0)	1.000	9/1/2019	0.13	0.44	4.39
PFTeDA	376-06-7	0.88	U	I6205-FS(0)	1.000	9/1/2019	0.22	0.88	4.39
NMeFOSAA	2355-31-9	1.75	U	I6205-FS(0)	1.000	9/1/2019	0.49	1.75	4.39
NEtFOSAA	2991-50-6	0.88	U	I6205-FS(0)	1.000	9/1/2019	0.43	0.88	4.39
PFBS	375-73-5	0.19	J	I6205-FS(0)	1.000	9/1/2019	0.11	0.44	4.39
PFHxS	355-46-4	0.57	J	I6205-FS(0)	1.000	9/1/2019	0.10	0.35	4.39
PFOS	1763-23-1	0.30	J	I6205-FS(0)	1.000	9/1/2019	0.17	0.44	4.39
HFPO-DA	13252-13-6	0.35	U	I6205-FS(0)	1.000	9/1/2019	0.18	0.35	4.39
Adona	919005-14-4	0.35	U	I6205-FS(0)	1.000	9/1/2019	0.16	0.35	4.39
11Cl-PF3OUdS	763051-92-9	0.35	U	I6205-FS(0)	1.000	9/1/2019	0.16	0.35	4.39
9Cl-PF3ONS	756426-58-1	0.35	U	I6205-FS(0)	1.000	9/1/2019	0.09	0.35	4.39

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	NSP-EB-01-20190812
Battelle ID	I6205-FS
Sample Type	SA
Collection Date	08/12/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	73	I6205-FS(0)	9/1/2019
13C4-PFHpA	72	I6205-FS(0)	9/1/2019
13C8-PFOA	74	I6205-FS(0)	9/1/2019
13C9-PFNA	73	I6205-FS(0)	9/1/2019
13C6-PFDA	76	I6205-FS(0)	9/1/2019
13C7-PFUnA	80	I6205-FS(0)	9/1/2019
13C2-PFDoA	75	I6205-FS(0)	9/1/2019
13C2-PFTeDA	74	I6205-FS(0)	9/1/2019
d3-MeFOSAA	76	I6205-FS(0)	9/1/2019
d5-EtFOSAA	80	I6205-FS(0)	9/1/2019
13C3-PFBS	79	I6205-FS(0)	9/1/2019
13C3-PFHxS	87	I6205-FS(0)	9/1/2019
13C8-PFOS	61	I6205-FS(0)	9/1/2019
13C3-HFPO-DA	67	I6205-FS(0)	9/1/2019

Appendix C

Support Documentation

ANALYTE	ORIGINAL NSP-MW-03-20190812	DUPLICATE NSP-DUP-01-20190812	RL	RPD	RPD > 30% Aqueous	ORIGINAL SAMPLE CONC >2xRL	DUPLICATE SAMPLE CONC >2xRL	DIFFERENCE >2XRL
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)	2.7	2.51	4.9	7.29	FALSE	FALSE	FALSE	FALSE
PENTADECAFLUOROOCTANOIC ACID (PFOA)	282.81	293.17	49.02	3.60	FALSE	TRUE	TRUE	FALSE
PERFLUOROBUTANESULFONIC ACID (PFBS)	140.75	105.77	4.9	28.38	FALSE	TRUE	TRUE	TRUE
PERFLUORODECANOIC ACID (PFDA)	9	7.24	4.9	21.67	FALSE	FALSE	FALSE	FALSE
PERFLUOROHEPTANOIC ACID (PFHPA)	144.16	146.13	49.02	1.36	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANESULFONIC ACID (PFHXS)	609.4	547.78	122.55	10.65	FALSE	TRUE	TRUE	FALSE
PERFLUOROHEXANOIC ACID (PFHXA)	267.51	278.06	49.02	3.87	FALSE	TRUE	TRUE	FALSE
PERFLUORONONANOIC ACID (PFNA)	99.03	96.79	49.02	2.29	FALSE	TRUE	FALSE	FALSE
PERFLUOROOCTANESULFONIC ACID (PFOS)	1513.8	1252.9	122.55	18.86	FALSE	TRUE	TRUE	TRUE
PERFLUOROUNDECANOIC ACID (PFUNA)	1.06	0.72	4.9	38.20	TRUE	FALSE	FALSE	FALSE

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Chain-of-Custody

Client Contact Information

Project Manager: Mary Mang
Sampler Information (print name): Seth Oshier
Phone: 765-404-0868
Email: seth.oshier@tetratech.com

Turnaround Time (TAT) Requested:
Normal ✓
Priority ☐
RUSH ☐

Project Name: Naval Station Philadelphia
Project No.: 112G08005-WE4
Time Zone: EST

Sampling Site:

Site Information:

COC #

Page#

Preservative: None

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	Total # of Cont.	PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15		
NSP-MW-02-20190812	8/12/2019	1215	GRAB	GW	2	X		I6197
NSP-MW-03-20190812	8/12/2019	1100	GRAB	GW	2	X		I6198
NSP-MW-04-20190812	8/12/2019	0940	GRAB	GW	6	X		I6199
NSP-MW-07-20190812	8/12/2019	0935	GRAB	GW	2	X		I6200
NSP-MW-08-20190812	8/12/2019	1115	GRAB	GW	2	X		I6201
NSP-DUP-01-20190812	8/12/2019	1200	GRAB	GW	2	X	Duplicate	I6202
NSP-Driller Water-20190810	8/10/2019	0830	GRAB	GW	2	X		I6203
NSP-FB-03-20190812	8/12/2019	1005	GRAB	FB	2	X	Field Blank	I6204
NSP-EB-01-20190812	8/12/2019	0945	GRAB	EB	2	X	Equipment Blank	I6205

Receipt Temperature:(°C)

Samples Intact: Yes - No

Samples on Ice: Yes - No

Receipt Comments:

Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
[signature]	Tetra Tech	8-12-2019 @ 1600	[signature]	Battelle	8-13-19 1000
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Comments:
Concentrations unknown; Levels may be elevated
Fed Ex Tracking #: 7759 6177 3259

Sample Summary

Client: Tetra Tech, Inc.
SDG: 19-0746
Project/Site: Naval Station Philadelphia
CTO: WE14

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
CV125PB-FS	Procedural Blank	WATER	8/20/2019	8/20/2019
CV126LCS-FS	Laboratory Control Sample	WATER	8/20/2019	8/20/2019
I6197-FS	NSP-MW-02-20190812	GW	8/12/2019	8/13/2019
I6198-FS	NSP-MW-03-20190812	GW	8/12/2019	8/13/2019
I6199-FS	NSP-MW-04-20190812	GW	8/12/2019	8/13/2019
I6199MS-FS	NSP-MW-04-20190812	GW	8/12/2019	8/13/2019
I6199MSD-FS	NSP-MW-04-20190812	GW	8/12/2019	8/13/2019
I6200-FS	NSP-MW-07-20190812	GW	8/12/2019	8/13/2019
I6201-FS	NSP-MW-08-20190812	GW	8/12/2019	8/13/2019
I6202-FS	NSP-DUP-01-20190812	GW	8/12/2019	8/13/2019
I6203-FS	NSP-Driller Water-20190810	GW	8/10/2019	8/13/2019
I6204-FS	NSP-FB-03-20190812	FB	8/12/2019	8/13/2019
I6205-FS	NSP-EB-01-20190812	EB	8/12/2019	8/13/2019

QA/QC Summary
Batch 19-0746

Project:	CTO-WE14: Naval Station Philadelphia, PA
Client Project Manager:	Mary Mang
Parameters:	PFAS
Laboratory:	Battelle, Norwell, MA
Matrix:	EB, FB, GW
Data Set:	DP-19-0635
Analytical SOP:	5-369
Method Reference:	PFAS to QSM 5.1.1 Table B-15

Sample Custody		
Collection Date	Receipt Date	Temp (°C)
8/10 and 12/2019	8/13/2019	0.8
Corrective Actions	None	
Sample Storage	The water samples were stored refrigerated until extraction.	
Related samples	NA	

	METHOD SUMMARIES
Sample Preparation	Water samples were spiked with surrogates in the original sample container from the field. The water was extracted using a weak ion exchange solid phase extraction (SPE) cartridge and eluted from the SPE with 0.4% NH_3 in methanol. Extracts were concentrated to dryness under nitrogen with a water bath set between 35 °C and 45 °C, reconstituted with 80:20 methanol/water (V/V) and fortified with internal standard. Extracts were transferred for LC-MS/MS analysis.
Prep comments	None.
Analysis	PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/L concentrations.
Analysis Comments	Samples analyzed on Sciex 5500 LC-MS/MS. PFHxS and PFOS in the PB, LCS, MS, MSD, and field samples (when detected) were detected and reported as a combination of the branched and linear isomers. Due to suspected matrix interferences, 9Cl-PF3ONS is quantified versus d5-EtFOSAA.

Holding Times	Extraction Date(s)	Analysis Date(s)
	8/20/2019	9/1 – 4/2019

QA/QC Summary
Batch 19-0746

Procedural Blank (PB)	A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination.
≤ ½ the LOQ Samples >10x PB	No exceedances noted.
	No comments.

Laboratory Control Spike (LCS)	A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery	No exceedances noted.
	No comments.

Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A MS/MSD was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery and <30% RPD	Four (4) recovery and three (3) precision exceedances noted.
	Exceedances were for analytes which required dilutions in the parent sample.

Extracted Internal Standard Analytes	Labelled analog compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.
50-150% of true value	No exceedances noted.
	No comments.

Internal Standard Analytes	Labelled analog compounds were added prior to analysis.
+/- 50% of the area of the L5 calibration point.	No exceedances noted.
	No comments.

Initial Calibration (ICAL)	The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadradic curve fitting.
+/- 30% of true value, $R^2 \geq 0.99$	No exceedances noted.
	No comments.

Independent Calibration Check (ICC)	The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.
+/- 30% of true value	No exceedances noted.
	No comments.

QA/QC Summary
Batch 19-0746

Continuing Calibration Verification (CCV)	Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid.
+/- 30% of true value	No exceedances noted.
	KP85 CCV (9/3/2019 14:36:13) mis-injected as evident by the IS area, however, this CCV was not needed as the samples were bracketed by the initial calibration and a closing CCV. All analytes in the CCV passed criteria (the quant report from this CCV can be found in the unused data section of the full data package). KP84 CCV (9/3/2019 16:24:03) – recoveries for PFHxA for both transitions were outside of acceptable criteria. PFHxA was not reported from samples bracketed by this CCV and there is no impact on the data.

Instrument Blank (IB)	Immediately following the highest standard analyzed and daily prior to sample analysis.
≤ ½ the LOQ	No exceedances noted.
	No comments.

BATTELLE
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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project Number: 100134616-CTOWE14
Preparation Batch: 19-0746
Data Set: DP-19-0635
Test Code: Master_369B

QC Parameter:	Exceed:	Justification:
Procedural Blank	0	None
PB Measurement Quality Objective	0	None
Laboratory Control Sample	0	None
Matrix Spike / Matrix Spike Duplicate Recovery	4	Exceedences were for analytes which required dilutions in the parent sample. LMG 9/4/18
Matrix Spike / Matrix Spike Duplicate Precision	3	Exceedences were for analytes which required dilutions in the parent sample. LMG 9/4/18
Extracted Internal Standard Analytes (Surrogates)	0	None
Instrument Calibration	0	None
Instrument Blank	0	None
Independent Calibration Check	0	None
Continuing Calibration Verification	0	None

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BATTELLE - NORWELL OPERATIONS
MISCELLANEOUS DOCUMENTATION FORM

Project Title:	CTO-WE14: Naval Station Philadelphia,	**Data Set Number:**	DP-19-0635
Project Number:	100134616-CTOWE14	**Prep Batch Number:**	19-0746
Entered By:	Lauren Griffith	**Entered On:**	09/04/2019
Test Code (Matrix Type):	Master_369B(L)		

Samples that were manually integrated are noted on the quant reports with the comment (TRUE).
LMG 9/4/19

KP87 is not being used in the SIS calibration curve for d3-MeFOSAA. There is no impact on the data once this point of the calibration is removed.
LMG 9/4/19

KP87 is not being used in the A_SIS calibration curve for d3-MeFOSAA. There is no impact on the data once this point of the calibration is removed.
LMG 9/4/19

KP81 is not being used in the BASE calibration curve for 11Cl-pf3OUdS. There is no impact on the data once this point of the calibration is removed.
LMG 9/4/19

KP81 is not being used in the A_BASE calibration curve for 11Cl-pf3OUdS. There is no impact on the data once this point of the calibration is removed.
LMG 9/4/19

KP84 (9/3/2019 16:24:03) exhibited recoveries outside of criteria forPFHxA for both transitions. PFHxA was not reported from the samples bracketed by this CCV, so there was no impact on the data.
LMG 9/4/19

9Cl-PF3ONS is quantified using d5-EtFOSAA in the BASE method.
LMG 9/4/19

Task Leader Approval:

SupervisorApproval:

PM Approval:

Digitally signed by Jonathan Thorn
Date: 2019.09.04 14:10:03 -04'00'

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	KP88 IB
Battelle ID	KP88 IB_09/01/2019
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	09/01/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		DL	LOD	LOQ
PFHxA	307-24-4	0.50	U	0.19	0.50	5.00
PFHpA	375-85-9	0.50	U	0.16	0.50	5.00
PFOA	335-67-1	0.50	U	0.18	0.50	5.00
PFNA	375-95-1	1.00	U	0.26	1.00	5.00
PFDA	335-76-2	0.50	U	0.16	0.50	5.00
PFUnA	2058-94-8	1.00	U	0.29	1.00	5.00
PFDoA	307-55-1	0.50	U	0.18	0.50	5.00
PFTrDA	72629-94-8	0.50	U	0.15	0.50	5.00
PFTeDA	376-06-7	1.00	U	0.25	1.00	5.00
NMeFOSAA	2355-31-9	2.00	U	0.56	2.00	5.00
NEtFOSAA	2991-50-6	1.00	U	0.49	1.00	5.00
PFBS	375-73-5	0.50	U	0.13	0.50	5.00
PFHxS	355-46-4	0.40	U	0.11	0.40	5.00
PFOS	1763-23-1	0.50	U	0.19	0.50	5.00
HFPO-DA	13252-13-6	0.40	U	0.20	0.40	5.00
Adona	919005-14-4	0.40	U	0.18	0.40	5.00
11Cl-PF3OUdS	763051-92-9	0.40	U	0.18	0.40	5.00
9Cl-PF3ONS	756426-58-1	0.40	U	0.10	0.40	5.00

Surrogate Recoveries (%)	
13C5-PFHxA	109
13C4-PFHpA	102
13C8-PFOA	110
13C9-PFNA	106
13C6-PFDA	111
13C7-PFUnA	100
13C2-PFDoA	96
13C2-PFTeDA	94
d3-MeFOSAA	102
d5-EtFOSAA	102
13C3-PFBS	99
13C3-PFHxS	105
13C8-PFOS	105
13C3-HFPO-DA	99

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	KP88 IB
Battelle ID	KP88 IB_09/02/2019
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	09/02/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		DL	LOD	LOQ
PFHxA	307-24-4	0.50	U	0.19	0.50	5.00
PFHpA	375-85-9	0.50	U	0.16	0.50	5.00
PFOA	335-67-1	0.50	U	0.18	0.50	5.00
PFNA	375-95-1	1.00	U	0.26	1.00	5.00
PFDA	335-76-2	0.50	U	0.16	0.50	5.00
PFUnA	2058-94-8	1.00	U	0.29	1.00	5.00
PFDoA	307-55-1	0.50	U	0.18	0.50	5.00
PFTrDA	72629-94-8	0.50	U	0.15	0.50	5.00
PFTeDA	376-06-7	1.00	U	0.25	1.00	5.00
NMeFOSAA	2355-31-9	2.00	U	0.56	2.00	5.00
NEtFOSAA	2991-50-6	1.00	U	0.49	1.00	5.00
PFBS	375-73-5	0.50	U	0.13	0.50	5.00
PFHxS	355-46-4	0.40	U	0.11	0.40	5.00
PFOS	1763-23-1	0.50	U	0.19	0.50	5.00
HFPO-DA	13252-13-6	0.40	U	0.20	0.40	5.00
Adona	919005-14-4	0.40	U	0.18	0.40	5.00
11Cl-PF3OUdS	763051-92-9	0.40	U	0.18	0.40	5.00
9Cl-PF3ONS	756426-58-1	0.40	U	0.10	0.40	5.00

Surrogate Recoveries (%)	
13C5-PFHxA	100
13C4-PFHpA	106
13C8-PFOA	96
13C9-PFNA	99
13C6-PFDA	99
13C7-PFUnA	102
13C2-PFDoA	101
13C2-PFTeDA	100
d3-MeFOSAA	107
d5-EtFOSAA	94
13C3-PFBS	92
13C3-PFHxS	95
13C8-PFOS	96
13C3-HFPO-DA	94

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	KP88 IB
Battelle ID	KP88 IB_09/03/2019
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	09/03/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		DL	LOD	LOQ
PFHxA	307-24-4	0.50	U	0.19	0.50	5.00
PFHpA	375-85-9	0.50	U	0.16	0.50	5.00
PFOA	335-67-1	0.50	U	0.18	0.50	5.00
PFNA	375-95-1	1.00	U	0.26	1.00	5.00
PFDA	335-76-2	0.50	U	0.16	0.50	5.00
PFUnA	2058-94-8	1.00	U	0.29	1.00	5.00
PFDoA	307-55-1	0.50	U	0.18	0.50	5.00
PFTrDA	72629-94-8	0.50	U	0.15	0.50	5.00
PFTeDA	376-06-7	1.00	U	0.25	1.00	5.00
NMeFOSAA	2355-31-9	2.00	U	0.56	2.00	5.00
NEtFOSAA	2991-50-6	1.00	U	0.49	1.00	5.00
PFBS	375-73-5	0.50	U	0.13	0.50	5.00
PFHxS	355-46-4	0.40	U	0.11	0.40	5.00
PFOS	1763-23-1	0.50	U	0.19	0.50	5.00
HFPO-DA	13252-13-6	0.40	U	0.20	0.40	5.00
Adona	919005-14-4	0.40	U	0.18	0.40	5.00
11Cl-PF3OUdS	763051-92-9	0.40	U	0.18	0.40	5.00
9Cl-PF3ONS	756426-58-1	0.40	U	0.10	0.40	5.00

Surrogate Recoveries (%)	
13C5-PFHxA	106
13C4-PFHpA	100
13C8-PFOA	103
13C9-PFNA	113
13C6-PFDA	109
13C7-PFUnA	111
13C2-PFDoA	102
13C2-PFTeDA	101
d3-MeFOSAA	98
d5-EtFOSAA	106
13C3-PFBS	105
13C3-PFHxS	109
13C8-PFOS	96
13C3-HFPO-DA	95

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	Procedural Blank
Battelle ID	CV125PB-FS
Sample Type	PB
Collection Date	08/20/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.19	0.50	5.00
PFHpA	375-85-9	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.16	0.50	5.00
PFOA	335-67-1	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.18	0.50	5.00
PFNA	375-95-1	1.00 U	CV125PB-FS(0)	1.000	9/1/2019	0.26	1.00	5.00
PFDA	335-76-2	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.16	0.50	5.00
PFUnA	2058-94-8	1.00 U	CV125PB-FS(0)	1.000	9/1/2019	0.29	1.00	5.00
PFDoA	307-55-1	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.18	0.50	5.00
PFTrDA	72629-94-8	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.15	0.50	5.00
PFTeDA	376-06-7	1.00 U	CV125PB-FS(0)	1.000	9/1/2019	0.25	1.00	5.00
NMeFOSAA	2355-31-9	2.00 U	CV125PB-FS(0)	1.000	9/1/2019	0.56	2.00	5.00
NEtFOSAA	2991-50-6	1.00 U	CV125PB-FS(0)	1.000	9/1/2019	0.49	1.00	5.00
PFBS	375-73-5	0.50 U	CV125PB-FS(0)	1.000	9/1/2019	0.13	0.50	5.00
PFHxS	355-46-4	0.40 U	CV125PB-FS(0)	1.000	9/1/2019	0.11	0.40	5.00
PFOS	1763-23-1	1.86 J	CV125PB-FS(0)	1.000	9/1/2019	0.19	0.50	5.00
HFPO-DA	13252-13-6	0.40 U	CV125PB-FS(0)	1.000	9/1/2019	0.20	0.40	5.00
Adona	919005-14-4	0.40 U	CV125PB-FS(0)	1.000	9/1/2019	0.18	0.40	5.00
11Cl-PF3OUdS	763051-92-9	0.40 U	CV125PB-FS(0)	1.000	9/1/2019	0.18	0.40	5.00
9Cl-PF3ONS	756426-58-1	0.40 U	CV125PB-FS(0)	1.000	9/1/2019	0.10	0.40	5.00

BATTELLE
It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	Procedural Blank
Battelle ID	CV125PB-FS
Sample Type	PB
Collection Date	08/20/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	81	CV125PB-FS(0)	9/1/2019
13C4-PFHpA	85	CV125PB-FS(0)	9/1/2019
13C8-PFOA	83	CV125PB-FS(0)	9/1/2019
13C9-PFNA	78	CV125PB-FS(0)	9/1/2019
13C6-PFDA	88	CV125PB-FS(0)	9/1/2019
13C7-PFUnA	82	CV125PB-FS(0)	9/1/2019
13C2-PFDoA	79	CV125PB-FS(0)	9/1/2019
13C2-PFTeDA	80	CV125PB-FS(0)	9/1/2019
d3-MeFOSAA	75	CV125PB-FS(0)	9/1/2019
d5-EtFOSAA	81	CV125PB-FS(0)	9/1/2019
13C3-PFBS	81	CV125PB-FS(0)	9/1/2019
13C3-PFHxS	89	CV125PB-FS(0)	9/1/2019
13C8-PFOS	73	CV125PB-FS(0)	9/1/2019
13C3-HFPO-DA	73	CV125PB-FS(0)	9/1/2019

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It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	Laboratory Control Sample
Battelle ID	CV126LCS-FS
Sample Type	LCS
Collection Date	08/20/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Control Limits Upper
PFHxA	307-24-4	21.27	CV126LCS-FS(0)	1.000	9/1/2019	20.20	105		51	137
PFHpA	375-85-9	21.12	CV126LCS-FS(0)	1.000	9/1/2019	20.00	106		48	136
PFOA	335-67-1	22.57	CV126LCS-FS(0)	1.000	9/1/2019	20.00	113		49	141
PFNA	375-95-1	20.68	CV126LCS-FS(0)	1.000	9/1/2019	20.00	103		58	122
PFDA	335-76-2	20.54	CV126LCS-FS(0)	1.000	9/1/2019	20.00	103		59	135
PFUnA	2058-94-8	20.05	CV126LCS-FS(0)	1.000	9/1/2019	20.00	100		64	134
PFDoA	307-55-1	22.51	CV126LCS-FS(0)	1.000	9/1/2019	20.00	113		75	131
PFTrDA	72629-94-8	20.90	CV126LCS-FS(0)	1.000	9/1/2019	20.00	105		42	148
PFTeDA	376-06-7	21.24	CV126LCS-FS(0)	1.000	9/1/2019	20.00	106		42	158
NMeFOSAA	2355-31-9	17.88	CV126LCS-FS(0)	1.000	9/1/2019	20.00	89		50	146
NEtFOSAA	2991-50-6	18.68	CV126LCS-FS(0)	1.000	9/1/2019	20.00	93		51	131
PFBS	375-73-5	19.47	CV126LCS-FS(0)	1.000	9/1/2019	20.00	97		56	134
PFHxS	355-46-4	18.20	CV126LCS-FS(0)	1.000	9/1/2019	20.20	90		52	128
PFOS	1763-23-1	23.70	CV126LCS-FS(0)	1.000	9/1/2019	20.20	117		40	144
HFPO-DA	13252-13-6	25.33	CV126LCS-FS(0)	1.000	9/1/2019	20.00	127		70	130
Adona	919005-14-4	21.37	CV126LCS-FS(0)	1.000	9/1/2019	20.00	107		70	130
11Cl-PF3OUdS	763051-92-9	24.50	CV126LCS-FS(0)	1.000	9/1/2019	18.84	130		70	130
9Cl-PF3ONS	756426-58-1	21.36	CV126LCS-FS(0)	1.000	9/1/2019	18.64	115		70	130

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Client ID	Laboratory Control Sample
Battelle ID	CV126LCS-FS
Sample Type	LCS
Collection Date	08/20/2019
Extraction Date	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	70	CV126LCS-FS(0)	9/1/2019
13C4-PFHpA	77	CV126LCS-FS(0)	9/1/2019
13C8-PFOA	70	CV126LCS-FS(0)	9/1/2019
13C9-PFNA	71	CV126LCS-FS(0)	9/1/2019
13C6-PFDA	78	CV126LCS-FS(0)	9/1/2019
13C7-PFUnA	79	CV126LCS-FS(0)	9/1/2019
13C2-PFDoA	80	CV126LCS-FS(0)	9/1/2019
13C2-PFTeDA	84	CV126LCS-FS(0)	9/1/2019
d3-MeFOSAA	96	CV126LCS-FS(0)	9/1/2019
d5-EtFOSAA	82	CV126LCS-FS(0)	9/1/2019
13C3-PFBS	82	CV126LCS-FS(0)	9/1/2019
13C3-PFHxS	89	CV126LCS-FS(0)	9/1/2019
13C8-PFOS	70	CV126LCS-FS(0)	9/1/2019
13C3-HFPO-DA	68	CV126LCS-FS(0)	9/1/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

			MS/MSD Background Sample								
Client ID		NSP-MW-04-20190812	NSP-MW-04-20190812								
Battelle ID		I6199MS-FS	I6199-FS								
Sample Type		MS	SA								
Collection Date		08/12/2019	08/12/2019								
Extraction Date		08/20/2019	08/20/2019								
Analytical Instrument		Sciex 5500 LC/MS/MS	Sciex 5500 LC/MS/MS								
% Moisture		NA	NA								
Matrix		GW	GW								
Sample Size		0.275	0.270								
Size Unit-Basis		L	L							Control Limits	
Analyte	CAS No.	Result (ng/L)	Result (ng/L)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Lower	Upper
PFHxA	307-24-4	315.00 D	263.28 D	I6199MS-FS-D(3)	50.000	9/1/2019	36.73	141	N	51	137
PFHpA	375-85-9	246.06 D	211.01 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.36	96		48	136
PFOA	335-67-1	323.27 D	285.08 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.36	105		49	141
PFNA	375-95-1	167.10 D	142.34 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.36	68		58	122
PFDA	335-76-2	38.28	1.07 J	I6199MS-FS(0)	1.000	9/1/2019	36.36	102		59	135
PFUnA	2058-94-8	37.77	0.93 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	104		64	134
PFDoA	307-55-1	40.06	0.46 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	110		75	131
PFTrDA	72629-94-8	38.26	0.46 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	105		42	148
PFTeDA	376-06-7	39.50	0.93 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	109		42	158
NMeFOSAA	2355-31-9	32.14	1.85 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	88		50	146
NEtFOSAA	2991-50-6	37.68	0.93 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	104		51	131
PFBS	375-73-5	89.26 D	68.30 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.36	58		56	134
PFHxS	355-46-4	367.02 D	336.54 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.73	83		52	128
PFOS	1763-23-1	129.85 D	118.31 D	I6199MS-FS-D(11)	5.000	9/3/2019	36.73	31	N	40	144
HFPO-DA	13252-13-6	48.82	3.35 J	I6199MS-FS(0)	1.000	9/1/2019	36.36	125		70	130
Adona	919005-14-4	27.31	0.37 U	I6199MS-FS(0)	1.000	9/1/2019	36.36	75		70	130
11Cl-PF3OUdS	763051-92-9	41.21	0.37 U	I6199MS-FS(0)	1.000	9/1/2019	34.25	120		70	130
9Cl-PF3ONS	756426-58-1	37.78	0.37 U	I6199MS-FS(0)	1.000	9/1/2019	33.89	111		70	130

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It can be done

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

		MS/MSD Background Sample
Client ID	NSP-MW-04-20190812	NSP-MW-04-20190812
Battelle ID	I6199MS-FS	I6199-FS
Sample Type	MS	SA
Collection Date	08/12/2019	08/12/2019
Extraction Date	08/20/2019	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	57	D	I6199MS-FS-D(11)	9/3/2019
13C4-PFHpA	62	D	I6199MS-FS-D(11)	9/3/2019
13C8-PFOA	68	D	I6199MS-FS-D(11)	9/3/2019
13C9-PFNA	73	D	I6199MS-FS-D(11)	9/3/2019
13C6-PFDA	75		I6199MS-FS(0)	9/1/2019
13C7-PFUnA	79		I6199MS-FS(0)	9/1/2019
13C2-PFDoA	92		I6199MS-FS(0)	9/1/2019
13C2-PFTeDA	101		I6199MS-FS(0)	9/1/2019
d3-MeFOSAA	80	D	I6199MS-FS-D(11)	9/3/2019
d5-EtFOSAA	70	D	I6199MS-FS-D(11)	9/3/2019
13C3-PFBS	85	D	I6199MS-FS-D(11)	9/3/2019
13C3-PFHxS	92	D	I6199MS-FS-D(11)	9/3/2019
13C8-PFOS	87	D	I6199MS-FS-D(11)	9/3/2019
13C3-HFPO-DA	53	D	I6199MS-FS-D(11)	9/3/2019

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

			MS/MSD Background Sample											
Client ID		NSP-MW-04-20190812	NSP-MW-04-20190812											
Battelle ID		I6199MSD-FS	I6199-FS											
Sample Type		MSD	SA											
Collection Date		08/12/2019	08/12/2019											
Extraction Date		08/20/2019	08/20/2019											
Analytical Instrument		Sciex 5500 LC/MS/MS	Sciex 5500 LC/MS/MS											
% Moisture		NA	NA											
Matrix		GW	GW											
Sample Size		0.270	0.270											
Size Unit-Basis		L	L				Analysis				Control Limits			RPD
Analyte	CAS No.	Result (ng/L)	Result (ng/L)	Extract ID	DF	Date	Target	Recovery	Qual	Lower	Upper	RPD	Qual	Limit
PFHxA	307-24-4	327.86 D	263.28 D	I6199MSD-FS-D(3)	50.000	9/1/2019	37.41	173	N	51	137	20.4		≤ 30
PFHpA	375-85-9	213.71 D	211.01 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.04	7	N	48	136	172.8	N	≤ 30
PFOA	335-67-1	329.90 D	285.08 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.04	121		49	141	14.2		≤ 30
PFNA	375-95-1	166.04 D	142.34 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.04	64		58	122	6.1		≤ 30
PFDA	335-76-2	40.63	1.07 J	I6199MSD-FS(0)	1.000	9/1/2019	37.04	107		59	135	4.8		≤ 30
PFUnA	2058-94-8	35.32	0.93 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	95		64	134	9.0		≤ 30
PFDoA	307-55-1	41.52	0.46 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	112		75	131	1.8		≤ 30
PFTrDA	72629-94-8	40.08	0.46 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	108		42	148	2.8		≤ 30
PFTeDA	376-06-7	40.35	0.93 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	109		42	158	0.0		≤ 30
NMeFOSAA	2355-31-9	37.19	1.85 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	100		50	146	12.8		≤ 30
NEtFOSAA	2991-50-6	38.78	0.93 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	105		51	131	1.0		≤ 30
PFBS	375-73-5	100.68 D	68.30 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.04	87		56	134	40.0	N	≤ 30
PFHxS	355-46-4	361.30 D	336.54 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.41	66		52	128	22.8		≤ 30
PFOS	1763-23-1	137.30 D	118.31 D	I6199MSD-FS-D(11)	5.000	9/3/2019	37.41	51		40	144	48.8	N	≤ 30
HFPO-DA	13252-13-6	51.63	3.35 J	I6199MSD-FS(0)	1.000	9/1/2019	37.04	130		70	130	3.9		≤ 30
Adona	919005-14-4	30.31	0.37 U	I6199MSD-FS(0)	1.000	9/1/2019	37.04	82		70	130	8.9		≤ 30
11Cl-PF3OUdS	763051-92-9	43.64	0.37 U	I6199MSD-FS(0)	1.000	9/1/2019	34.89	125		70	130	4.1		≤ 30
9Cl-PF3ONS	756426-58-1	41.04	0.37 U	I6199MSD-FS(0)	1.000	9/1/2019	34.52	119		70	130	7.0		≤ 30

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

		MS/MSD Background Sample
Client ID	NSP-MW-04-20190812	NSP-MW-04-20190812
Battelle ID	I6199MSD-FS	I6199-FS
Sample Type	MSD	SA
Collection Date	08/12/2019	08/12/2019
Extraction Date	08/20/2019	08/20/2019
Analytical Instrument	Sciex 5500 LC/MS/MS	Sciex 5500 LC/MS/MS

Surrogate Recoveries (%)	**Recovery**		**Extract ID**	**Analysis Date**
13C5-PFHxA	55	D	I6199MSD-FS-D(11)	9/3/2019
13C4-PFHpA	68	D	I6199MSD-FS-D(11)	9/3/2019
13C8-PFOA	67	D	I6199MSD-FS-D(11)	9/3/2019
13C9-PFNA	73	D	I6199MSD-FS-D(11)	9/3/2019
13C6-PFDA	69		I6199MSD-FS(0)	9/1/2019
13C7-PFUnA	81		I6199MSD-FS(0)	9/1/2019
13C2-PFDoA	86		I6199MSD-FS(0)	9/1/2019
13C2-PFTeDA	98		I6199MSD-FS(0)	9/1/2019
d3-MeFOSAA	59	D	I6199MSD-FS-D(11)	9/3/2019
d5-EtFOSAA	62	D	I6199MSD-FS-D(11)	9/3/2019
13C3-PFBS	64	D	I6199MSD-FS-D(11)	9/3/2019
13C3-PFHxS	77	D	I6199MSD-FS-D(11)	9/3/2019
13C8-PFOS	72	D	I6199MSD-FS-D(11)	9/3/2019
13C3-HFPO-DA	56	D	I6199MSD-FS-D(11)	9/3/2019

Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported

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Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

Preparation Batch: 19-0746
Data Set: DP-19-0635

		CV125PB-FS (Procedural Blank)	CV126LCS-FS (Laboratory Control Sample)	I6199MS-FS (NSP-MW-04-20190812)	I6199MSD-FS (NSP-MW-04-20190812)	I6197-FS (NSP-MW-02-20190812)	I6198-FS (NSP-MW-03-20190812)	I6199-FS (NSP-MW-04-20190812)	I6200-FS (NSP-MW-07-20190812)	I6201-FS (NSP-MW-08-20190812)	I6202-FS (NSP-DUP-01-20190812)	I6203-FS (NSP-Driller Water-20190810)	I6204-FS (NSP-FB-03-20190812)	I6205-FS (NSP-EB-01-20190812)
PFHxA	307-24-4	-	L	L	L	L	L	L	L	L	L	L	-	L
PFHpA	375-85-9	-	L	L	L	L	L	L	L	L	L	-	-	-
PFOA	335-67-1	-	L	L	L	L	L	L	L	L	L	L	L	L
PFNA	375-95-1	-	L	L	L	L	L	L	L	L	L	-	-	-
PFDA	335-76-2	-	L	L	L	L	L	L	L	L	L	-	-	-
PFUnA	2058-94-8	-	L	L	L	L	L	-	-	-	L	-	-	-
PFDoA	307-55-1	-	L	L	L	-	-	-	-	-	-	-	-	-
PFTrDA	72629-94-8	-	L	L	L	-	-	-	-	-	-	-	-	-
PFTeDA	376-06-7	-	L	L	L	-	-	-	-	-	-	-	-	-
NMeFOSAA	2355-31-9	-	L	L	L	-	-	-	-	-	-	-	-	-
NEtFOSAA	2991-50-6	-	L	L	L	-	-	-	-	-	-	-	-	-
PFBS	375-73-5	-	L	L	L	L	L	L	L	L	L	L	-	L
PFHxS	355-46-4	-	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	-	L/Br
PFOS	1763-23-1	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	L/Br	-	L/Br
HFPO-DA	13252-13-6	-	L	L	L	L	L	L	L	L	L	L	-	-
Adona	919005-14-4	-	L	L	L	-	-	-	-	-	-	-	-	-
11Cl-PF3OUdS	763051-92-9	-	L	L	L	-	-	-	-	-	-	-	-	-
9Cl-PF3ONS	756426-58-1	-	L	L	L	-	-	-	-	-	-	-	-	-

"L" :Linear
"Br": branched
"L/Br": Linear/Branched
"-": Not detected

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

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			Passing criteria = 50% to 150% of internal standard area (compared to mid-point of calibration)							
Sample Name	Sample ID	Analysis Date	13C3-PFBA		13C2-PFOA		13C2-PFDA		13C4-PFOS	
KP85	L5	9/1/19 1:58	-		124,098.05		157,224.26		30,179.95	
		Lower	-		62,049.03		78,612.13		15,089.98	
		Upper	-		186,147.08		235,836.39		45,269.93	

Sample Name	Sample ID	Analysis Date	13C3-PFBA	Qual	User	13C2-PFOA	Qual	User	13C2-PFDA	Qual	User	13C4-PFOS	Qual	User
KP81	L1	9/1/19 1:15	-			119,271.40			155,934.12			27,002.92		
KP82	L2	9/1/19 1:26	-			123,641.42			159,027.01			30,029.97		
KP83	L3	9/1/19 1:36	-			114,404.53			145,921.73			28,193.69		
KP84	L4	9/1/19 1:47	-			136,595.78			162,193.52			29,791.47		
KP85	L5	9/1/19 1:58	-			124,098.05			157,224.26			30,179.95		
KP86	L6	9/1/19 2:09	-			123,571.91			142,326.85			24,375.48		
KP87	L7	9/1/19 2:19	-			123,389.19			138,275.15			22,779.58		
KP88 IB	IB	9/1/19 2:30	-			108,157.46			141,248.91			26,321.41		
KP89 ICC	ICC	9/1/19 2:41	-			113,524.19			135,036.97			25,339.64		
KP85 CCV	CCV	9/1/19 5:12	-			127,237.06			156,153.30			26,099.14		
CV125PB-FS(0)	Procedural Blank	9/1/19 5:34	-			148,635.45			171,855.26			32,088.89		
CV126LCS-FS(0)	Laboratory Control Sample	9/1/19 5:44	-			147,416.88			159,825.19			30,253.21		
I6197-FS(0)	NSP-MW-02-20190812	9/1/19 5:55	-			150,155.52			162,581.43			26,313.52		
I6197-FS-D(3)	NSP-MW-02-20190812	9/1/19 6:06	-			186,006.59			198,446.15			38,382.85		
I6198-FS(0)	NSP-MW-03-20190812	9/1/19 6:28	-			146,318.81			158,286.67			24,312.40		
I6198-FS-D(3)	NSP-MW-03-20190812	9/1/19 6:38	-			186,130.01			180,405.54			36,701.65		
I6198-FS-D(5)	NSP-MW-03-20190812	9/1/19 6:49	-			183,830.30			190,938.40			30,412.60		
KP84 CCV	CCV	9/1/19 7:00	-			126,637.50			152,903.90			27,839.96		
I6199-FS(0)	NSP-MW-04-20190812	9/1/19 7:22	-			140,016.26			141,749.51			28,678.09		
I6199-FS-D(3)	NSP-MW-04-20190812	9/1/19 7:32	-			158,160.54			189,303.32			37,765.90		
I6200-FS(0)	NSP-MW-07-20190812	9/1/19 8:15	-			~~955,688.74~~	~~N~~	~~1~~	129,288.53			24,603.46		
I6201-FS(0)	NSP-MW-08-20190812	9/1/19 8:26	-			122,188.00			157,565.88			28,724.33		

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

BATTELLE
It can be done

			Passing criteria = 50% to 150% of internal standard area (compared to mid-point of calibration)							
Sample Name	Sample ID	Analysis Date	13C3-PFBA		13C2-PFOA		13C2-PFDA		13C4-PFOS	
KP85	L5	9/1/19 1:58	-		124,098.05		157,224.26		30,179.95	
		Lower	-		62,049.03		78,612.13		15,089.98	
		Upper	-		186,147.08		235,836.39		45,269.93	

Sample Name	Sample ID	Analysis Date	13C3-PFBA	Qual	User	13C2-PFOA	Qual	User	13C2-PFDA	Qual	User	13C4-PFOS	Qual	User
I6201-FS-D(3)	NSP-MW-08-20190812	9/1/19 8:37	-			182,471.89			188,628.38			38,523.58		
I6203-FS(0)	NSP-Driller Water-20190810	9/1/19 8:48	-			184,896.29			185,252.27			35,212.83		
KP85 CCV	CCV	9/1/19 8:59	-			121,893.27			152,126.36			28,574.85		
I6205-FS(0)	NSP-EB-01-20190812	9/1/19 9:31	-			142,010.34			165,062.99			31,052.96		
I6199MS-FS(0)	NSP-MW-04-20190812	9/1/19 9:42	-			126,989.31			132,894.00			27,921.49		
I6199MS-FS-D(3)	NSP-MW-04-20190812	9/1/19 9:53	-			167,176.96			197,964.52			38,935.63		
KP84 CCV	CCV	9/1/19 10:36	-			128,943.93			167,782.10			34,028.23		
I6199MSD-FS(0)	NSP-MW-04-20190812	9/1/19 10:58	-			144,831.02			154,156.89			31,570.42		
I6199MSD-FS-D(3)	NSP-MW-04-20190812	9/1/19 11:08	-			142,787.54			162,153.97			28,594.06		
I6202-FS(0)	NSP-DUP-01-20190812	9/1/19 11:52	-			149,204.94			168,389.17			22,062.82		
I6202-FS-D(3)	NSP-DUP-01-20190812	9/1/19 12:02	-			184,106.82			197,376.33			34,060.81		
I6202-FS-D(5)	NSP-DUP-01-20190812	9/1/19 12:13	-			175,689.26			194,442.22			36,795.18		
I6202-FS-D(7)	NSP-DUP-01-20190812	9/1/19 12:24	-			156,095.42			177,228.19			35,624.87		
KP85 CCV	CCV	9/1/19 12:35	-			137,034.59			169,117.82			32,384.33		
KP84 ISC	ISC	9/2/19 13:02	-			119,562.16			139,938.92			27,236.95		
KP88 IB	IB	9/2/19 13:24	-			117,490.63			142,807.78			26,865.83		
I6204-FS(0)	NSP-FB-03-20190812	9/2/19 13:34	-			183,920.99			197,959.95			32,647.45		
KP85 CCV	CCV	9/2/19 14:39	-			95,775.21			111,195.74			21,285.66		

1 Internal standard area was enhanced by a high concentration of PFOA in the native sample, which was reported from a higher dilution LMG 9/4/19

Project Client: Tetra Tech
Project Name: CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis
Project No.: 100134616-CTOWE14

BATTELLE
It can be done

			Passing criteria = 50% to 150% of internal standard area (compared to mid-point of calibration)							
Sample Name	Sample ID	Analysis Date	13C3-PFBA		13C2-PFOA		13C2-PFDA		13C4-PFOS	
KP85	L5	9/3/19 13:09	-		113,017.84		135,618.15		28,205.58	
		Lower	-		56,508.92		67,809.08		14,102.79	
		Upper	-		169,526.76		203,427.23		42,308.37	

Sample Name	Sample ID	Analysis Date	13C3-PFBA	Qual	User	13C2-PFOA	Qual	User	13C2-PFDA	Qual	User	13C4-PFOS	Qual	User
KP81	L1	9/3/19 12:26	-			113,791.01			140,477.45			25,330.37		
KP82	L2	9/3/19 12:37	-			117,928.02			138,901.65			24,764.36		
KP83	L3	9/3/19 12:47	-			98,940.69			120,629.81			21,559.63		
KP84	L4	9/3/19 12:58	-			116,238.68			139,914.29			27,369.67		
KP85	L5	9/3/19 13:09	-			113,017.84			135,618.15			28,205.58		
KP86	L6	9/3/19 13:20	-			119,516.95			136,741.49			24,434.63		
KP87	L7	9/3/19 13:31	-			107,710.33			106,308.14			19,964.10		
KP88 IB	IB	9/3/19 13:41	-			119,562.92			135,917.57			25,207.90		
KP89 ICC	ICC	9/3/19 13:52	-			108,237.22			132,425.89			22,161.02		
I6199-FS-D(11)	NSP-MW-04-20190812	9/3/19 14:46	-			147,334.90			155,722.85			30,887.29		
I6199MS-FS-D(11)	NSP-MW-04-20190812	9/3/19 15:08	-			165,661.58			178,851.15			29,705.28		
I6199MSD-FS-D(11)	NSP-MW-04-20190812	9/3/19 15:30	-			155,431.33			176,387.80			31,159.13		
I6200-FS-D(7)	NSP-MW-07-20190812	9/3/19 16:13	-			~~256,263.12~~	~~N~~	~~1~~	168,769.11			31,320.31		
KP84 CCV	CCV	9/3/19 16:24	-			112,200.87			131,985.17			23,893.42		
KP84 CCV	CCV	9/4/19 9:18	-			111,300.50			135,964.03			26,091.22		
I6200-FS-D(9)	NSP-MW-07-20190812	9/4/19 9:28	-			131,740.58			141,363.68			26,592.06		
I6200-FS-D(11)	NSP-MW-07-20190812	9/4/19 9:39	-			119,646.04			143,100.54			26,116.71		
KP85 CCV	CCV	9/4/19 10:01	-			116,101.00			132,227.41			23,183.56		
I6200-FS-D(13)	NSP-MW-07-20190812	9/4/19 10:45	-			96,845.18			114,877.31			21,494.36		
KP85 CCV	CCV	9/4/19 10:55	-			109,502.49			131,299.62			24,158.86		

1 Internal standard area was enhanced by a high concentration of PFOA in the native sample, which was reported from a higher dilution LMG 9/4/19

BATTELLE

Mass Spectral Acquisition Rate Report

Created with Analyst Reporter
Printed: 04/09/2019 12:15:23 PM

Sample Name	KP87	**Injection Vial**	8
Sample ID	L7	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:19:54 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
PFBS_1	298.9 / 80.0	1.43	62	>10
PFBS_2	298.9 / 99.0	1.43	62	>10
PFHxA_1	313.0 / 269.0	1.74	36	>10
PFHxA_2	313.0 / 119.0	1.74	33	>10
PFHpA_1	363.0 / 319.0	2.15	36	>10
PFHpA_2	363.0 / 169.0	2.15	36	>10
PFHxS_1	399.0 / 80.0	2.17	61	>10
PFHxS_2	399.0 / 99.0	2.17	61	>10
PFOA_1	413.0 / 369.0	2.56	47	>10
PFOA_2	413.0 / 169.0	2.56	42	>10
PFNA_1	463.0 / 419.0	2.95	38	>10
PFNA_2	463.0 / 219.0	2.95	39	>10
PFOS_1	499.0 / 80.0	2.95	65	>10
PFOS_2	499.0 / 99.0	2.95	64	>10
PFDA_1	513.0 / 469.0	3.31	66	>10
PFDA_2	513.0 / 219.0	3.31	42	>10
PFUnA_1	563.0 / 519.0	3.63	61	>10
PFUnA_2	563.0 / 269.0	3.63	60	>10
PFDoA_1	613.0 / 569.0	3.91	55	>10
PFDoA_2	613.0 / 319.0	3.91	64	>10
PFTrDA_1	663.0 / 619.0	4.16	72	>10
PFTrDA_2	663.0 / 169.0	4.15	69	>10
PFTeDA_1	713.0 / 669.0	4.37	95	>10
PFTeDA_2	713.0 / 169.0	4.37	66	>10
NMeFOSAA_1	570.0 / 419.0	3.47	39	>10
NMeFOSAA_2	570.0 / 512.0	3.47	29	>10
NEtFOSAA_1	584.0 / 419.0	3.63	29	>10
NEtFOSAA_2	584.0 / 483.0	3.63	27	>10
HFPO-DA_1	285.0 / 169.0	1.86	36	>10
HFPO-DA_2	285.0 / 118.8	1.86	30	>10
ADONA_1	377.0 / 251.0	2.19	69	>10
ADONA_2	377.0 / 85.0	2.19	39	>10
9Cl-PF3ONS_1	531.0 / 351.0	3.15	63	>10
9Cl-PF3ONS_2	531.0 / 83.0	3.15	46	>10
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	76	>10
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	26	>10

BATTELLE

Mass Spectral Acquisition Rate Report

Created with Analyst Reporter
Printed: 04/09/2019 12:15:31 PM

Sample Name	KP87	**Injection Vial**	8
Sample ID	L7	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:19:54 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
13C2-PFDoA	615.0 / 570.0	3.90	32	>10
d3-MeFOSAA	573.0 / 419.0	3.46	29	>10
d5-EtFOSAA	589.0 / 419.0	3.62	32	>10
13C5-PFHxA	318.0 / 273.0	1.73	35	>10
13C4-PFHpA	367.0 / 322.0	2.14	47	>10
13C8-PFOA	421.0 / 376.0	2.55	35	>10
13C9-PFNA	472.0 / 427.0	2.94	32	>10
13C6-PFDA	519.0 / 474.0	3.30	34	>10
13C7-PFUnA	570.0 / 525.0	3.61	36	>10
13C2-PFTeDA	715.0 / 670.0	4.36	49	>10
13C3-PFBS	302.0 / 99.0	1.42	32	>10
13C3-PFHxS	402.0 / 99.0	2.17	24	>10
13C8-PFOS	507.0 / 99.0	2.94	26	>10
13C3-HFPO-DA	287.0 / 169.0	1.86	42	>10

BATTELLE

Mass Spectral Acquisition Rate Report

Created with Analyst Reporter
Printed: 04/09/2019 12:15:39 PM

Sample Name	KP87	**Injection Vial**	11
Sample ID	L7	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 1:31:00 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
PFBS_1	298.9 / 80.0	1.46	59	>10
PFBS_2	298.9 / 99.0	1.46	55	>10
PFHxA_1	313.0 / 269.0	1.78	30	>10
PFHxA_2	313.0 / 119.0	1.78	36	>10
PFHpA_1	363.0 / 319.0	2.19	34	>10
PFHpA_2	363.0 / 169.0	2.19	33	>10
PFHxS_1	399.0 / 80.0	2.21	59	>10
PFHxS_2	399.0 / 99.0	2.21	63	>10
PFOA_1	413.0 / 369.0	2.60	43	>10
PFOA_2	413.0 / 169.0	2.60	35	>10
PFNA_1	463.0 / 419.0	2.99	38	>10
PFNA_2	463.0 / 219.0	2.99	42	>10
PFOS_1	499.0 / 80.0	2.99	57	>10
PFOS_2	499.0 / 99.0	2.99	61	>10
PFDA_1	513.0 / 469.0	3.35	63	>10
PFDA_2	513.0 / 219.0	3.35	44	>10
PFUnA_1	563.0 / 519.0	3.67	68	>10
PFUnA_2	563.0 / 269.0	3.67	44	>10
PFDoA_1	613.0 / 569.0	3.95	81	>10
PFDoA_2	613.0 / 319.0	3.95	63	>10
PFTrDA_1	663.0 / 619.0	4.20	73	>10
PFTrDA_2	663.0 / 169.0	4.19	47	>10
PFTeDA_1	713.0 / 669.0	4.41	65	>10
PFTeDA_2	713.0 / 169.0	4.41	67	>10
NMeFOSAA_1	570.0 / 419.0	3.50	30	>10
NMeFOSAA_2	570.0 / 512.0	3.50	37	>10
NEtFOSAA_1	584.0 / 419.0	3.67	26	>10
NEtFOSAA_2	584.0 / 483.0	3.67	29	>10
HFPO-DA_1	285.0 / 169.0	1.90	34	>10
HFPO-DA_2	285.0 / 118.8	1.90	25	>10
ADONA_1	377.0 / 251.0	2.23	66	>10
ADONA_2	377.0 / 85.0	2.23	45	>10
9Cl-PF3ONS_1	531.0 / 351.0	3.19	60	>10
9Cl-PF3ONS_2	531.0 / 83.0	3.19	26	>10
11Cl-pf3OUdS_1	631.0 / 451.0	3.80	74	>10
11Cl-pf3OUdS_2	631.0 / 83.0	3.80	32	>10

BATTELLE

Mass Spectral Acquisition Rate Report

Created with Analyst Reporter
Printed: 04/09/2019 12:15:47 PM

Sample Name	KP87	**Injection Vial**	11
Sample ID	L7	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 1:31:00 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
13C2-PFDoA	615.0 / 570.0	3.94	30	>10
d3-MeFOSAA	573.0 / 419.0	3.50	24	>10
d5-EtFOSAA	589.0 / 419.0	3.66	20	>10
13C5-PFHxA	318.0 / 273.0	1.77	46	>10
13C4-PFHpA	367.0 / 322.0	2.18	38	>10
13C8-PFOA	421.0 / 376.0	2.59	40	>10
13C9-PFNA	472.0 / 427.0	2.98	46	>10
13C6-PFDA	519.0 / 474.0	3.34	42	>10
13C7-PFUnA	570.0 / 525.0	3.66	37	>10
13C2-PFTeDA	715.0 / 670.0	4.41	37	>10
13C3-PFBS	302.0 / 99.0	1.45	41	>10
13C3-PFHxS	402.0 / 99.0	2.21	27	>10
13C8-PFOS	507.0 / 99.0	2.98	36	>10
13C3-HFPO-DA	287.0 / 169.0	1.89	30	>10

BATTELLE
It can be done

Precision and Bias at the LOQ for PFAS in non-potable Water

Analyte	CAS No.	Average (ng/L)	ST DEV	2 Sigma	n
PFBA	375-22-4	11.71	1.73	3.46	23
PFPeA	2706-90-3	10.17	1.32	2.64	17
PFHxA	307-24-4	9.83	1.28	2.56	62
PFHpA	375-85-9	9.41	1.34	2.68	62
PFOA	335-67-1	9.98	1.51	3.02	64
PFNA	375-95-1	9.59	1.13	2.26	62
PFDA	335-76-2	9.69	1.20	2.40	62
PFUnA	2058-94-8	9.74	1.16	2.32	62
PFDoA	307-55-1	10.45	1.21	2.42	62
PFTrDA	72629-94-8	10.64	1.65	3.30	62
PFTeDA	376-06-7	10.48	1.63	3.26	62
NMeFOSAA	2355-31-9	10.21	1.72	3.44	62
NEtFOSAA	2991-50-6	9.57	1.46	2.92	62
PFOSA	754-91-6	9.80	0.76	1.52	14
PFBS	375-73-5	9.85	1.33	2.66	63
PFPeS	2706-91-4	9.31	1.10	2.20	11
PFHxS	355-46-4	9.70	1.29	2.58	62
PFHpS	375-92-8	10.60	1.01	2.02	20
PFOS	1763-23-1	9.92	1.28	2.56	62
PFNS	68259-12-1	9.35	0.98	1.96	9
PFDS	335-77-3	9.98	1.55	3.10	18
4:2FTS	757124-72-4	10.40	1.78	3.56	15
6:2FTS	27619-97-2	11.35	2.48	4.96	19
8:2FTS	39108-34-4	11.04	2.20	4.40	19
HFPO-DA	13252-13-6	10.71	1.00	2.00	7
Adona	919005-14-4	9.90	1.28	2.56	7
11Cl-PF3OUdS	763051-92-9	9.90	0.83	1.66	7
9Cl-PF3ONS	756426-58-1	9.58	0.89	1.78	7

BATTELLE DETECTION LIMITS FOR PFAS IN NON-POTABLE WATER

QSM 5.1.1 compliant with Table B-15 requirements

Analyte	CAS No.	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
PFBA	375-22-4	0.14	0.5	5.0
PFPeA	2706-90-3	0.31	1.0	5.0
PFHxA	307-24-4	0.19	0.5	5.0
PFHpA	375-85-9	0.16	0.5	5.0
PFOA	335-67-1	0.18	0.5	5.0
PFNA	375-95-1	0.26	1.0	5.0
PFDA	335-76-2	0.16	0.5	5.0
PFUnA	2058-94-8	0.29	1.0	5.0
PFDoA	307-55-1	0.18	0.5	5.0
PFTrDA	72629-94-8	0.15	0.5	5.0
PFTeDA	376-06-7	0.25	1.0	5.0
NMeFOSAA	2355-31-9	0.56	2.0	5.0
NEtFOSAA	2991-50-6	0.49	1.0	5.0
PFOSA	754-91-6	0.27	1.0	5.0
PFBS	375-73-5	0.13	0.5	5.0
PFPeS	2706-91-4	0.67	2.5	5.0
PFHxS	355-46-4	0.11	0.4	5.0
PFHpS	375-92-8	0.20	0.5	5.0
PFOS	1763-23-1	0.19	0.5	5.0
PFNS	68259-12-1	0.46	1.0	5.0
PFDS	335-77-3	0.17	0.5	5.0
4:2FTS	747124-72-4	0.14	0.5	5.0
6:2FTS	27619-97-2	1.36	2.5	5.0
8:2FTS	39108-34-4	0.22	0.5	5.0
HFPO-DA	13252-13-6	0.20	0.40	5.0
Adona	919005-14-4	0.18	0.40	5.0
11Cl-PF3OUdS	763051-92-9	0.18	0.40	5.0
9Cl-PF3ONS	756426-58-1	0.10	0.40	5.0

Analytes on ELAP QSM 5.1 Scope of accreditation

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ID 596 07/19

Analytical Transitions for PFAS in non-potable water, solid, and tissue

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
PFBA	375-22-4	Target	213.0 / 169.0	NA
PFPeA	2706-90-3	Target	263.0 / 219.0	NA
PFHxA	307-24-4	Target	313.0 / 269.0	313.0 / 119.0
PFHpA	375-85-9	Target	363.0 / 319.0	363.0 / 169.0
PFOA	335-67-1	Target	413.0 / 369.0	413.0 / 169.0
PFNA	375-95-1	Target	463.0 / 419.0	463.0 / 219.0
PFDA	335-76-2	Target	513.0 / 469.0	513.0 / 219.0
PFUnA	2058-94-8	Target	563.0 / 519.0	563.0 / 269.0
PFDoA	307-55-1	Target	613.0 / 569.0	613.0 / 319.0
PFTrDA	72629-94-8	Target	663.0 / 619.0	663.0 / 169.0
PFTeDA	376-06-7	Target	713.0 / 669.0	713.0 / 169.0
NMeFOSAA	2355-31-9	Target	570.0 / 419.0	570.0 / 512.0
NEtFOSAA	2991-50-6	Target	584.0 / 419.0	584.0 / 483.0
PFOSA	754-91-6	Target	498.0 / 78.0	498.0 / 83.0
PFBS	375-73-5	Target	299.0 / 80.0	299.0 / 99.0
PFPeS	BDO-2114	Target	349.0 / 99.0	249.0 / 80.0
PFHxS	355-46-4	Target	399.0 / 80.0	399.0 / 99.0
PFHpS	375-99-6	Target	449.0 / 80.0	449.0 / 99.0
PFOS	1763-23-1	Target	499.0 / 80.0	499.0 / 99.0
PFNS	98789-57-2	Target	549.0 / 99.0	549.0 / 80.0
PFDS	2806-15-7	Target	599.0 / 80.0	599.0 / 99.0
4:2FTS	BDO-2205	Target	327.0 / 307.0	327.0 / 80.0
6:2FTS	27619-97-2	Target	427.0 / 407.0	427.0 / 81.0
8:2FTS	39108-34-4	Target	527.0 / 507.0	527.0 / 487.0
3:3 FTCA	356-02-5	Target	241.0 / 177.0	NA
5:3 FTCA	914637-49-3	Target	341.0 / 237.0	NA
7:3 FTCA	812-70-4	Target	441.0 / 337.0	NA
HFPO-DA	13252-13-6	Target	285.0 /169.0	285.0 /118.8
Adona	919005-14-4	Target	377.0 / 251.0	377.0 / 85.0
9Cl-PF3ONS	756426-58-1	Target	531.0 / 351.0	531.0 / 83.0
11Cl-PF3OUdS	763051-92-9	Target	631.0 / 451.0	631.0 / 83.0

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
13C4-PFBA	NA	SIS[1]	217.0 / 172.0	NA
13C5-PFPeA	NA	SIS[1]	268.0 / 223.0	NA
13C5-PFHxA	NA	SIS[1]	318.0 / 273.0	NA
13C4-PFHpA	NA	SIS[1]	367.0 / 322.0	NA
13C8-PFOA	NA	SIS[1]	421.0 / 376.0	NA
13C9-PFNA	NA	SIS[1]	472.0 / 427.0	NA
13C6-PFDA	NA	SIS[1]	519.0 / 474.0	NA
13C7-PFUnA	NA	SIS[1]	570.0 / 525.0	NA
13C2-PFDoA	NA	SIS[1]	615.0 / 570.0	NA
13C2-PFTeDA	NA	SIS[1]	715.0 / 670.0	NA
d3-MeFOSAA	NA	SIS[1]	573.0 / 419.0	NA
d5-EtFOSAA	NA	SIS[1]	589.0 / 419.0	NA
13C8-FOSA	NA	SIS[1]	506.0 / 78.0	NA
13C3-PFBS	NA	SIS[1]	302.0 / 99.0	NA
13C3-PFHxS	NA	SIS[1]	402.0 / 99.0	NA
13C8-PFOS	NA	SIS[1]	507.0 / 99.0	NA
13C2-4:2FTS	NA	SIS[1]	329.0 / 81.0	NA
13C2-6:2FTS	NA	SIS[1]	429.0 / 81.0	NA
13C2-8:2FTS	NA	SIS[1]	529.0 / 81.0	NA
$^{13}C_3$-HFPO-DA	NA	SIS	287.0 / 169.0	NA
13C3-PFBA	NA	IS[2]	216.0 / 172.0	NA
13C2-PFOA	NA	IS[2]	415.0 / 370.0	NA
13C2-PFDA	NA	IS[2]	515.0 / 470.0	NA
13C4-PFOS	NA	IS[2]	503.0 / 99.0	NA

[1] – extracted internal standard (surrogate)
[2] – injection internal standard

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Non-Potable Water Calibration to Sample Equivalents

ICAL (ng/L)	PIV (mL)	DF[1]	Sample Size (L)	Sample Equivalent (ng/L)[2]
25	1	1	0.250	0.1
50	1	1	0.250	0.2
100	1	1	0.250	0.4
250	1	1	0.250	1.0
500	1	1	0.250	2.0
1,000	1	1	0.250	4.0
2,500	1	1	0.250	10.0
10,000	1	1	0.250	40.0
20,000	1	1	0.250	80.0

[1] - base level dilution as part of the extraction procedure

[2] - calculated equivalent of a sample based on the ICAL concentration

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SAMPLE PREPARATION RECORDS

Project Title(s)	Project No.(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis	100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

SOP Numbers (see workplan for modifications)

ExtractionSOP No. 5-370

This Batch Contains The Following Samples:		
CV125PB-FS	I6199MSD-FS	I6205-FS
CV126LCS-FS	I6200-FS	
I6197-FS	I6201-FS	
I6198-FS	I6202-FS	
I6199-FS	I6203-FS	
I6199MS-FS	I6204-FS	

Laboratory Preparation Records

COMPLETE AND VALIDATED

Prep Task Leader: Kevin Bailey

Approved By:	Date	Initials
Denise Schumitz	09/04/2019	DMS

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BATTELLE - NORWELL OPERATIONS
SAMPLE IDENTIFICATION PAGE

Project Title(s)	Project No.(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis	100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Sample ID	Description
CV125PB-FS	Procedural Blank
CV126LCS-FS	Laboratory Control Sample
I6197-FS	NSP-MW-02-20190812
I6198-FS	NSP-MW-03-20190812
I6199-FS	NSP-MW-04-20190812
I6199MS-FS	Matrix Spike of NSP-MW-04-20190812
I6199MSD-FS	Matrix Spike Duplicate of NSP-MW-04-20190812
I6200-FS	NSP-MW-07-20190812
I6201-FS	NSP-MW-08-20190812
I6202-FS	NSP-DUP-01-20190812
I6203-FS	NSP-Driller Water-20190810
I6204-FS	NSP-FB-03-20190812
I6205-FS	NSP-EB-01-20190812

Samples Assigned By: Jonathan Thorn Date : August 13, 2019

Comments:

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BATTELLE - NORWELL OPERATIONS
SAMPLE CUSTODY LOG

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Requested On/By:	08/20/2019 KH	**Purpose:**	Sample Preparation
Relinquished On/By:	08/20/2019 MDS	**Last Activity:**	Transfer

Accepted On/By:	08/20/2019 KH	**Returned On/To:**	
Stored In Facility:	Sample Preparation	**Returned To Facility:**	
Stored Until			
Stored Comment:	NA	**Returned Comment:**	NA

No.	BDO-ID:	Ctrs	*	Condition:	Custody Comment:
1	I6197	1	C	Consumed	NA
2	I6198	1	C	Consumed	NA
3	I6199	1	C	Consumed	NA
4	I6200	1	C	Consumed	NA
5	I6201	1	C	Consumed	NA
6	I6202	1	C	Consumed	NA
7	I6203	1	C	Consumed	NA
8	I6204	1	C	Consumed	NA
9	I6205	1	C	Consumed	NA
Total Samples	9	* "C" = Consumed Container			

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BATTELLE - NORWELL OPERATIONS
LIQUID SAMPLE ID FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Sample ID	Description	Volume (mL)	Bottles	*	Date Initials
CV125PB-FS	Procedural Blank	250.0	NA	--	08/20/19 KH
CV126LCS-FS	Laboratory Control Sample	250.0	NA	--	08/20/19 KH
I6197-FS	NSP-MW-02-20190812	260.0	1	C	08/27/19 RPK
I6198-FS	NSP-MW-03-20190812	255.0	1	C	08/27/19 RPK
I6199-FS	NSP-MW-04-20190812	270.0	1	C	08/27/19 RPK
I6199MS-FS	Matrix Spike	275.0	2	C	08/27/19 RPK
I6199MSD-FS	Matrix Spike Duplicate	270.0	3	C	08/27/19 RPK
I6200-FS	NSP-MW-07-20190812	260.0	1	C	08/27/19 RPK
I6201-FS	NSP-MW-08-20190812	280.0	1	C	08/27/19 RPK
I6202-FS	NSP-DUP-01-20190812	265.0	1	C	08/27/19 RPK
I6203-FS	NSP-Driller Water-20190810	255.0	1	C	08/27/19 RPK
I6204-FS	NSP-FB-03-20190812	285.0	1	C	08/27/19 RPK
I6205-FS	NSP-EB-01-20190812	285.0	1	C	08/27/19 RPK

Comments:

Samples Assigned By: Jonathan Thorn Date : August 13, 2019

* - "C" = Sample is Consumed

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BATTELLE - NORWELL OPERATIONS
SURROGATE SPIKE FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Sample ID	Standard ID	Type	Vial No.	Vol Added (uL)	Date Spiked/ Spiked By	Witn'd By	Comment
CV125PB-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
CV126LCS-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
CV126LCS-FS	KP80	LCS/MS	1	100	08/20/19 RPK	KH	NA
I6197-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6198-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6199-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6199MS-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6199MS-FS	KP80	LCS/MS	1	200	08/20/19 RPK	KH	NA
I6199MSD-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6199MSD-FS	KP80	LCS/MS	1	200	08/20/19 RPK	KH	NA
I6200-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6201-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6202-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6203-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6204-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA
I6205-FS	KP78	SIS	1	50	08/20/19 RPK	KH	NA

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
KP78	Pipette	B814659662
KP80	Pipette	B814659662
KP80	Pipette	B909301860

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BATTELLE - NORWELL OPERATIONS
SAMPLE EXTRACTION FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Sample ID	1st Extraction	2nd Extraction	3rd Extraction	Conc. ID	Turbo °C	Turbo PSI	KD °C	Comment
CV125PB-FS	08/20/19 KH	NA	NA	NA	NA	NA	NA	NA
CV126LCS-FS	08/20/19 KH	NA	NA	NA	NA	NA	NA	NA
I6197-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6198-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6199-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6199MS-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6199MSD-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6200-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6201-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6202-FS	08/20/19 RPK	NA	NA	NA	NA	NA	NA	NA
I6203-FS	08/20/19 KH	NA	NA	NA	NA	NA	NA	NA
I6204-FS	08/20/19 KH	NA	NA	NA	NA	NA	NA	NA
I6205-FS	08/20/19 KH	NA	NA	NA	NA	NA	NA	NA

Solvents/Reagent Preparations:

Name	ID	Expires	Lot No	Procedure	Comments
0.4% NH3 in Methanol	RP-190820-3	08/20/19	190931	Per 100 mL, 3.5 mL ammonia solution brought to 100 mL with methanol	
0.4% NH3 in Methanol	RP-190820-3	08/20/19	SHBK4201	Per 100 mL, 3.5 mL ammonia solution brought to 100 mL with methanol	
Pre-packed SPE Column	RP-190820-4	08/20/19	004739123A/0047	Pre-packed SPE Column	

Solvents/Reagents:

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BATTELLE - NORWELL OPERATIONS
EXTRACT SPIKE FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract Id	DF	Std. ID	Type	Vial No.	Vol. Added (uL)	Conc (ug/mL)	Added (ng)	Date Spiked/ Spiked By	Witn'd By
I6197-FS-D(3)	16.667	KP78	SIS	1	47	0	0	08/31/19 KB	KH
I6197-FS-D(5)	33.333	KP78	SIS	1	25	0	0	08/31/19 KB	KH
I6198-FS-D(3)	10	KP78	SIS	1	45	0	0	08/31/19 KB	KH
I6198-FS-D(5)	25	KP78	SIS	1	30	0	0	08/31/19 KB	KH
I6199-FS-D(3)	50	KP78	SIS	1	49	0	0	08/31/19 KB	KH
I6199-FS-D(5)	250	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199-FS-D(7)	833.333	KP78	SIS	1	35	0	0	08/31/19 KB	KH
I6199-FS-D(9)	2083.333	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199-FS-D(11)	5	KQ26	SIS	1	40	1	40	09/03/19 KB	KH
I6199-FS-D(13)	10	KQ26	SIS	1	45	1	45	09/03/19 KB	KH
I6199MS-FS-D(3)	50	KP78	SIS	1	49	0	0	08/31/19 KB	KH
I6199MS-FS-D(5)	250	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199MS-FS-D(7)	833.333	KP78	SIS	1	35	0	0	08/31/19 KB	KH
I6199MS-FS-D(9)	2083.333	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199MS-FS-D(11)	5	KQ26	SIS	1	40	1	40	09/03/19 KB	KH
I6199MS-FS-D(13)	10	KQ26	SIS	1	45	1	45	09/03/19 KB	KH
I6199MSD-FS-D(3)	50	KP78	SIS	1	49	0	0	08/31/19 KB	KH
I6199MSD-FS-D(5)	250	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199MSD-FS-D(7)	833.333	KP78	SIS	1	35	0	0	08/31/19 KB	KH
I6199MSD-FS-D(9)	2083.333	KP78	SIS	1	40	0	0	08/31/19 KB	KH
I6199MSD-FS-D(11)	5	KQ26	SIS	1	40	1	40	09/03/19 KB	KH
I6199MSD-FS-D(13)	10	KQ26	SIS	1	45	1	45	09/03/19 KB	KH
I6200-FS-D(3)	5	KQ26	SIS	1	40	1	40	09/03/19 KB	KH
I6200-FS-D(5)	10	KQ26	SIS	1	45	1	45	09/03/19 KB	KH
I6200-FS-D(7)	25	KQ26	SIS	1	30	1	30	09/03/19 KB	KH

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BATTELLE - NORWELL OPERATIONS
EXTRACT SPIKE FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract Id	DF	Std. ID	Type	Vial No.	Vol. Added (uL)	Conc (ug/mL)	Added (ng)	Date Spiked/ Spiked By	Witn'd By
I6200-FS-D(9)	250	KQ26	SIS	1	45	1	45	09/04/19 KB	KH
I6200-FS-D(11)	625	KQ26	SIS	1	30	1	30	09/04/19 KB	KH
I6200-FS-D(13)	3125	KQ26	SIS	1	40	1	40	09/03/19 KB	KH
I6201-FS-D(3)	10	KP78	SIS	1	45	0	0	08/31/19 KB	KH
I6202-FS-D(3)	10	KP78	SIS	1	45	0	0	08/31/19 KB	KH
I6202-FS-D(5)	20	KP78	SIS	1	25	0	0	08/31/19 KB	KH
I6202-FS-D(7)	40	KP78	SIS	1	25	0	0	08/31/19 KB	KH

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
KP78	Pipette	I0793912B
KP79	Pipette	B814659662
KP79	Pipette	I0793912B
KQ26	Pipette	I0793912B
KQ27	Pipette	I0793912B

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BATTELLE - NORWELL OPERATIONS
INTERNAL STANDARD SPIKING FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

(N/A Fraction)

Extract Id	Extr. Vol. (uL)	Added (uL)	Std. Id	Accm. (uL)	Vial No.	Pre Inj. Vol. (uL)^	Final Dilution *	Date Spiked/ Spiked By	Witn'd By
CV125PB-FS(0)	950	50	KP79	50	1	1000	1.000	09/03/19 KB	KH
CV126LCS-FS(0)	950	50	KP79	50	1	1000	1.000	09/03/19 KB	KH
I6197-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6197-FS-D(3)	953	47	KP79	50	1	1000	16.667	08/31/19 KB	KH
I6197-FS-D(5)	975	25	KP79	50	1	1000	33.333	08/31/19 KB	KH
I6198-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6198-FS-D(3)	955	45	KP79	50	1	1000	10.000	08/31/19 KB	KH
I6198-FS-D(5)	970	30	KP79	50	1	1000	25.000	08/31/19 KB	KH
I6199-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6199-FS-D(3)	951	49	KP79	50	1	1000	50.000	09/03/19 KB	KH
I6199-FS-D(5)	960	40	KP79	50	1	1000	250.000	08/31/19 KB	KH
I6199-FS-D(7)	965	35	KP79	50	1	1000	833.333	08/31/19 KB	KH
I6199-FS-D(9)	970	30	KP79	50	1	1000	2083.333	08/31/19 KB	KH
I6199-FS-D(11)	960	40	KP79	50	1	1000	5.000	09/03/19 KB	KH
I6199-FS-D(13)	955	45	KP79	50	1	1000	10.000	09/03/19 KB	KH
I6199MS-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6199MS-FS-D(3)	951	49	KP79	50	1	1000	50.000	08/31/19 KB	KH
I6199MS-FS-D(5)	960	40	KP79	50	1	1000	250.000	08/31/19 KB	KH
I6199MS-FS-D(7)	965	35	KP79	50	1	1000	833.333	08/31/19 KB	KH

* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.

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BATTELLE - NORWELL OPERATIONS
INTERNAL STANDARD SPIKING FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

(N/A Fraction)

Extract Id	Extr. Vol. (uL)	Added (uL)	Std. Id	Accm. (uL)	Vial No.	Pre Inj. Vol. (uL)^	Final Dilution *	Date Spiked/ Spiked By	Witn'd By
I6199MS-FS-D(9)	970	30	KP79	50	1	1000	2083.333	08/31/19 KB	KH
I6199MS-FS-D(11)	960	40	KP79	50	1	1000	5.000	09/03/19 KB	KH
I6199MS-FS-D(13)	955	45	KP79	50	1	1000	10.000	09/03/19 KB	KH
I6199MSD-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6199MSD-FS-D(3)	951	49	KP79	50	1	1000	50.000	08/31/19 KB	KH
I6199MSD-FS-D(5)	960	40	KP79	50	1	1000	250.000	08/31/19 KB	KH
I6199MSD-FS-D(7)	965	35	KP79	50	1	1000	833.333	08/31/19 KB	KH
I6199MSD-FS-D(9)	970	30	KP79	50	1	1000	2083.333	08/31/19 KB	KH
I6199MSD-FS-D(11)	960	40	KP79	50	1	1000	5.000	09/03/19 KB	KH
I6199MSD-FS-D(13)	955	45	KP79	50	1	1000	10.000	09/03/19 KB	KH
I6200-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6200-FS-D(3)	960	40	KP79	50	1	1000	5.000	09/03/19 KB	KH
I6200-FS-D(5)	955	45	KP79	70	1	1000	10.000	09/03/19 KB	KH
I6200-FS-D(7)	970	30	KP79	58	1	1000	25.000	09/03/19 KB	KH
I6200-FS-D(9)	955	45	KQ27	45	1	1000	250.000	09/04/19 KB	RPK
I6200-FS-D(11)	970	30	KQ27	48	1	1000	625.000	09/04/19 KB	RPK
I6200-FS-D(13)	960	40	KQ27	49.6	1	1000	3125.000	09/04/19 KB	RPK
I6201-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6201-FS-D(3)	955	45	KP79	50	1	1000	10.000	08/31/19 KB	KH

* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
INTERNAL STANDARD SPIKING FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

(N/A Fraction)

Extract Id	Extr. Vol. (uL)	Added (uL)	Std. Id	Accm. (uL)	Vial No.	Pre Inj. Vol. (uL)^	Final Dilution *	Date Spiked/ Spiked By	Witn'd By
I6202-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6202-FS-D(3)	955	45	KP79	50	1	1000	10.000	08/31/19 KB	KH
I6202-FS-D(5)	975	25	KP79	50	1	1000	20.000	08/31/19 KB	KH
I6202-FS-D(7)	975	25	KP79	50	1	1000	40.000	08/31/19 KB	KH
I6203-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6204-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH
I6205-FS(0)	950	50	KP79	50	1	1000	1.000	08/31/19 KB	KH

Syringes/Pipettes Used:

Std ID	Type	Syr/Pip
KP78	Pipette	I0793912B
KP79	Pipette	B814659662
KP79	Pipette	I0793912B
KQ26	Pipette	I0793912B
KQ27	Pipette	I0793912B

* - Final Dilution is any HPLC, dilutions, or other manipulation

^ - Pre Injection Volume (PIV) includes any RIS spikes.

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
CV125PB-FS	0	--	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 KH
CV126LCS-FS	0	--	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 KH
I6197-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6197-FS	2	--	8/31/2019 10:23:00 AM	I6197-FS	0	1000	940	1.064	1.064	08/31/19 KB
I6197-FS-D	3	C	8/31/2019 10:23:00 AM	I6197-FS	0	1000	60	16.667	16.667	08/31/19 KB
I6197-FS-D	4	--	8/31/2019 10:25:00 AM	I6197-FS-D	3	1000	500	2.000	33.333	08/31/19 KB
I6197-FS-D	5	--	8/31/2019 10:25:00 AM	I6197-FS-D	3	1000	500	2.000	33.333	08/31/19 KB
I6198-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6198-FS	2	--	8/31/2019 10:26:00 AM	I6198-FS	0	1000	900	1.111	1.111	08/31/19 KB
I6198-FS-D	3	C	8/31/2019 10:26:00 AM	I6198-FS	0	1000	100	10.000	10.000	08/31/19 KB
I6198-FS-D	4	--	8/31/2019 10:28:00 AM	I6198-FS-D	3	1000	600	1.667	16.667	08/31/19 KB
I6198-FS-D	5	--	8/31/2019 10:28:00 AM	I6198-FS-D	3	1000	400	2.500	25.000	08/31/19 KB
I6199-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6199-FS	2	C	8/31/2019 10:36:00 AM	I6199-FS	0	1000	980	1.020	1.020	08/31/19 KB

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
I6199-FS-D	3	C	8/31/2019 10:36:00 AM	I6199-FS	0	1000	20	50.000	50.000	08/31/19 KB
I6199-FS-D	4	--	8/31/2019 10:39:00 AM	I6199-FS-D	3	1000	800	1.250	62.500	08/31/19 KB
I6199-FS-D	5	C	8/31/2019 10:39:00 AM	I6199-FS-D	3	1000	200	5.000	250.000	08/31/19 KB
I6199-FS-D	6	--	8/31/2019 10:41:00 AM	I6199-FS-D	5	1000	700	1.429	357.143	08/31/19 KB
I6199-FS-D	7	C	8/31/2019 10:41:00 AM	I6199-FS-D	5	1000	300	3.333	833.333	08/31/19 KB
I6199-FS-D	8	--	8/31/2019 10:43:00 AM	I6199-FS-D	7	1000	600	1.667	1388.889	08/31/19 KB
I6199-FS-D	9	--	8/31/2019 10:43:00 AM	I6199-FS-D	7	1000	400	2.500	2083.333	08/31/19 KB
I6199-FS	10	C	9/3/2019 9:42:00 AM	I6199-FS	2	980	780	1.256	1.282	09/03/19 KB
I6199-FS-D	11	--	9/3/2019 9:42:00 AM	I6199-FS	2	980	200	4.900	5.000	09/03/19 KB
I6199-FS	12	--	9/3/2019 9:46:00 AM	I6199-FS	10	780	680	1.147	1.471	09/03/19 KB
I6199-FS-D	13	--	9/3/2019 9:46:00 AM	I6199-FS	10	780	100	7.800	10.000	09/03/19 KB
I6199MS-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6199MS-FS	2	C	8/31/2019 10:36:00 AM	I6199MS-FS	0	1000	980	1.020	1.020	08/31/19 KB
I6199MS-FS-D	3	C	8/31/2019 10:36:00 AM	I6199MS-FS	0	1000	20	50.000	50.000	08/31/19 KB

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
I6199MS-FS-D	4	--	8/31/2019 10:39:00 AM	I6199MS-FS-D	3	1000	800	1.250	62.500	08/31/19 KB
I6199MS-FS-D	5	C	8/31/2019 10:39:00 AM	I6199MS-FS-D	3	1000	200	5.000	250.000	08/31/19 KB
I6199MS-FS-D	6	--	8/31/2019 10:41:00 AM	I6199MS-FS-D	5	1000	700	1.429	357.143	08/31/19 KB
I6199MS-FS-D	7	C	8/31/2019 10:41:00 AM	I6199MS-FS-D	5	1000	300	3.333	833.333	08/31/19 KB
I6199MS-FS-D	8	--	8/31/2019 10:43:00 AM	I6199MS-FS-D	7	1000	600	1.667	1388.889	08/31/19 KB
I6199MS-FS-D	9	--	8/31/2019 10:43:00 AM	I6199MS-FS-D	7	1000	400	2.500	2083.333	08/31/19 KB
I6199MS-FS	10	C	9/3/2019 9:42:00 AM	I6199MS-FS	2	980	780	1.256	1.282	09/03/19 KB
I6199MS-FS-D	11	--	9/3/2019 9:42:00 AM	I6199MS-FS	2	980	200	4.900	5.000	09/03/19 KB
I6199MS-FS	12	--	9/3/2019 9:46:00 AM	I6199MS-FS	10	780	680	1.147	1.471	09/03/19 KB
I6199MS-FS-D	13	--	9/3/2019 9:46:00 AM	I6199MS-FS	10	780	100	7.800	10.000	09/03/19 KB
I6199MSD-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6199MSD-FS	2	C	8/31/2019 10:36:00 AM	I6199MSD-FS	0	1000	980	1.020	1.020	08/31/19 KB
I6199MSD-FS-D	3	C	8/31/2019 10:36:00 AM	I6199MSD-FS	0	1000	20	50.000	50.000	08/31/19 KB
I6199MSD-FS-D	4	--	8/31/2019 10:39:00 AM	I6199MSD-FS-D	3	1000	800	1.250	62.500	08/31/19 KB

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
I6199MSD-FS-D	5	C	8/31/2019 10:39:00 AM	I6199MSD-FS-D	3	1000	200	5.000	250.000	08/31/19 KB
I6199MSD-FS-D	6	--	8/31/2019 10:41:00 AM	I6199MSD-FS-D	5	1000	700	1.429	357.143	08/31/19 KB
I6199MSD-FS-D	7	C	8/31/2019 10:41:00 AM	I6199MSD-FS-D	5	1000	300	3.333	833.333	08/31/19 KB
I6199MSD-FS-D	8	--	8/31/2019 10:43:00 AM	I6199MSD-FS-D	7	1000	600	1.667	1388.889	08/31/19 KB
I6199MSD-FS-D	9	--	8/31/2019 10:43:00 AM	I6199MSD-FS-D	7	1000	400	2.500	2083.333	08/31/19 KB
I6199MSD-FS	10	C	9/3/2019 9:42:00 AM	I6199MSD-FS	2	980	780	1.256	1.282	09/03/19 KB
I6199MSD-FS-D	11	--	9/3/2019 9:42:00 AM	I6199MSD-FS	2	980	200	4.900	5.000	09/03/19 KB
I6199MSD-FS	12	--	9/3/2019 9:46:00 AM	I6199MSD-FS	10	780	680	1.147	1.471	09/03/19 KB
I6199MSD-FS-D	13	--	9/3/2019 9:46:00 AM	I6199MSD-FS	10	780	100	7.800	10.000	09/03/19 KB
I6200-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6200-FS	2	--	9/3/2019 10:16:00 AM	I6200-FS	0	1000	800	1.250	1.250	09/03/19 KB
I6200-FS-D	3	C	9/3/2019 10:16:00 AM	I6200-FS	0	1000	200	5.000	5.000	09/03/19 KB
I6200-FS-D	4	--	9/3/2019 10:18:00 AM	I6200-FS-D	3	1000	500	2.000	10.000	09/03/19 KB
I6200-FS-D	5	C	9/3/2019 10:18:00 AM	I6200-FS-D	3	1000	500	2.000	10.000	09/03/19 KB

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
I6200-FS-D	6	--	9/3/2019 10:20:00 AM	I6200-FS-D	5	1000	600	1.667	16.667	09/03/19 KB
I6200-FS-D	7	C	9/3/2019 10:20:00 AM	I6200-FS-D	5	1000	400	2.500	25.000	09/03/19 KB
I6200-FS-D	8	--	9/4/2019 8:19:00 AM	I6200-FS-D	7	1000	900	1.111	27.778	09/04/19 KB
I6200-FS-D	9	C	9/4/2019 8:19:00 AM	I6200-FS-D	7	1000	100	10.000	250.000	09/04/19 KB
I6200-FS-D	10	--	9/4/2019 8:22:00 AM	I6200-FS-D	9	1000	600	1.667	416.667	09/04/19 KB
I6200-FS-D	11	C	9/4/2019 8:22:00 AM	I6200-FS-D	9	1000	400	2.500	625.000	09/04/19 KB
I6200-FS-D	12	--	9/4/2019 10:34:00 AM	I6200-FS-D	11	1000	800	1.250	781.250	09/04/19 KB
I6200-FS-D	13	--	9/4/2019 10:34:00 AM	I6200-FS-D	11	1000	200	5.000	3125.000	09/04/19 KB
I6201-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6201-FS	2	--	8/31/2019 10:26:00 AM	I6201-FS	0	1000	900	1.111	1.111	08/31/19 KB
I6201-FS-D	3	--	8/31/2019 10:26:00 AM	I6201-FS	0	1000	100	10.000	10.000	08/31/19 KB
I6202-FS	0	C	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 RPK
I6202-FS	2	--	8/31/2019 10:26:00 AM	I6202-FS	0	1000	900	1.111	1.111	08/31/19 KB
I6202-FS-D	3	C	8/31/2019 10:26:00 AM	I6202-FS	0	1000	100	10.000	10.000	08/31/19 KB

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
PREPARATION EXTRACT SPLIT FORM

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Extract		*	Extract Date	Source		Initial Extract Vol (uL)	Extract Split	Extract Split	Total Dilution	Date/Initials
Name	#			Name	#					
I6202-FS-D	4	--	8/31/2019 10:46:00 AM	I6202-FS-D	3	1000	500	2.000	20.000	08/31/19 KB
I6202-FS-D	5	C	8/31/2019 10:46:00 AM	I6202-FS-D	3	1000	500	2.000	20.000	08/31/19 KB
I6202-FS-D	6	--	8/31/2019 10:51:00 AM	I6202-FS-D	5	1000	500	2.000	40.000	08/31/19 KB
I6202-FS-D	7	--	8/31/2019 10:51:00 AM	I6202-FS-D	5	1000	500	2.000	40.000	08/31/19 KB
I6203-FS	0	--	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 KH
I6204-FS	0	--	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 KH
I6205-FS	0	--	8/20/2019	NA		NA	NA	1.000	1.000	08/20/19 KH

Total Oil = [Sample Volume (uL) / Aliquot Volume (uL)] * [Aliquot Weight (mg)]
Dilution Factor = [Sample Volume (uL) / Aliqot Volume (uL))] * Prior Dilution Factor
* - "C" = Extract is Consumed

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
EXTRACT - INSTRUMENT FACILITY CUSTODY PAGE

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Purpose:	LC-MS/MS TRANSFER	**Last Activity:**	Prep->Inst
Relinquished On/By:	Aug 31 2019 1:44PM KB	**Received On/By:**	Aug 31 2019 1:44PM DMS
Relinquished From:	Sample Preparation: NA	**Received Location:**	LC Laboratory: NA
Relinquish Comment:	NA	**Received Comment:**	NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	CV125PB-FS(0)	1000	1	Intact	NA
2	CV126LCS-FS(0)	1000	1	Intact	NA
3	I6197-FS(0)	1000	1	Intact	NA
4	I6197-FS-D(3)	1000	16.667	Intact	NA
5	I6197-FS-D(5)	1000	33.333	Intact	NA
6	I6198-FS(0)	1000	1	Intact	NA
7	I6198-FS-D(3)	1000	10	Intact	NA
8	I6198-FS-D(5)	1000	25	Intact	NA
9	I6199-FS(0)	1000	1	Intact	NA
10	I6199-FS-D(3)	1000	50	Intact	NA
11	I6199-FS-D(5)	1000	250	Intact	NA
12	I6199-FS-D(7)	1000	833.333	Intact	NA
13	I6199-FS-D(9)	1000	2083.333	Intact	NA
14	I6199MS-FS(0)	1000	1	Intact	NA
15	I6199MS-FS-D(3)	1000	50	Intact	NA
16	I6199MS-FS-D(5)	1000	250	Intact	NA
17	I6199MS-FS-D(7)	1000	833.333	Intact	NA
18	I6199MS-FS-D(9)	1000	2083.333	Intact	NA
19	I6199MSD-FS(0)	1000	1	Intact	NA
20	I6199MSD-FS-D(3)	1000	50	Intact	NA
21	I6199MSD-FS-D(5)	1000	250	Intact	NA
22	I6199MSD-FS-D(7)	1000	833.333	Intact	NA
23	I6199MSD-FS-D(9)	1000	2083.333	Intact	NA
24	I6200-FS(0)	1000	1	Intact	NA
25	I6201-FS(0)	1000	1	Intact	NA
26	I6201-FS-D(3)	1000	10	Intact	NA
27	I6202-FS(0)	1000	1	Intact	NA
28	I6202-FS-D(3)	1000	10	Intact	NA

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
EXTRACT - INSTRUMENT FACILITY CUSTODY PAGE

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

29	I6202-FS-D(5)	1000	20	Intact	NA
30	I6202-FS-D(7)	1000	40	Intact	NA
31	I6203-FS(0)	1000	1	Intact	NA
32	I6204-FS(0)	1000	1	Intact	NA
33	I6205-FS(0)	1000	1	Intact	NA

Total Extracts: 33

Purpose: LC-MS/MS TRANSFER

Last Activity: Prep->Inst

Relinquished On/By: Sep 3 2019 10:48AM KB

Received On/By: Sep 3 2019 10:48AM LMG

Relinquished From: Sample Preparation: NA

Received Location: LC Laboratory: NA

Relinquish Comment: NA

Received Comment: NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	I6199-FS-D(11)	1000	5	Intact	NA
2	I6199-FS-D(13)	1000	10	Intact	NA
3	I6199MS-FS-D(11)	1000	5	Intact	NA
4	I6199MS-FS-D(13)	1000	10	Intact	NA
5	I6199MSD-FS-D(11)	1000	5	Intact	NA
6	I6199MSD-FS-D(13)	1000	10	Intact	NA
7	I6200-FS-D(3)	1000	5	Intact	NA
8	I6200-FS-D(5)	1000	10	Intact	NA
9	I6200-FS-D(7)	1000	25	Intact	NA

Total Extracts: 9

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
EXTRACT - INSTRUMENT FACILITY CUSTODY PAGE

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Purpose:	LC-MS/MS TRANSFER	**Last Activity:**	Prep->Inst
Relinquished On/By:	Sep 4 2019 8:49AM KB	**Received On/By:**	Sep 4 2019 8:49AM LMG
Relinquished From:	Sample Preparation: NA	**Received Location:**	LC Laboratory: NA
Relinquish Comment:	NA	**Received Comment:**	NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	I6200-FS-D(9)	1000	250	Intact	NA
2	I6200-FS-D(11)	1000	625	Intact	NA

Total Extracts: 2

Purpose:	LC-MS/MS TRANSFER	**Last Activity:**	Prep->Inst
Relinquished On/By:	Sep 4 2019 9:03AM KB	**Received On/By:**	Sep 4 2019 9:03AM LMG
Relinquished From:	Sample Preparation: NA	**Received Location:**	LC Laboratory: NA
Relinquish Comment:	NA	**Received Comment:**	NA

No.	BDO-ID:	PIV:	DF:	Condition:	Custody Comment:
1	I6200-FS-D(13)	1000	3125	Intact	NA

Total Extracts: 1

BATTELLE
It can be done

BATTELLE - NORWELL OPERATIONS
SAMPLE SPECIFIC COMMENTS

Project Title(s)
CTO-WE14: Naval Station Philadelphia, PA - PFAS Analysis

Project No.(s)
100134616-CTOWE14

19-0746

CTO-WE14: Non-Potable Water Analysis

EB, FB, GW

Sample ID:	Comment:	Date/Initials:
CV125PB-FS	Extraction began 10:13 AM, Extraction manifold 2, ended at 11:14 AM.	08/20/19 KH
CV126LCS-FS	Extraction began 10:13 AM, Extraction manifold 2, ended at 11:11 AM.	08/20/19 KH
I6197-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:05 PM.	08/20/19 RPK
I6198-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:08 PM.	08/20/19 RPK
I6199-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:06 PM.	08/20/19 RPK
I6199MS-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 11:59 AM.	08/20/19 RPK
I6199MSD-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:00 PM.	08/20/19 RPK
I6200-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:28 PM.	08/20/19 RPK
I6201-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:05 PM.	08/20/19 RPK
I6202-FS	Extraction began 10:13 AM, Extraction manifold 4, ended at 12:20 PM.	08/20/19 RPK
I6203-FS	Extraction began 10:13 AM, Extraction manifold 2, ended at 11:21 AM.	08/20/19 KH
I6204-FS	Extraction began 10:13 AM, Extraction manifold 2, ended at 11:25 AM.	08/20/19 KH
I6205-FS	Extraction began 10:13 AM, Extraction manifold 2, ended at 11:22 AM.	08/20/19 KH

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Sequence Report

Created with Analyst Reporter
Printed: 04/09/2019 12:55:55 PM

	Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File
	1	MeOH		9/1/2019 1:04:26 AM	5-0369.dam	AC_09012019_5-369.wiff
	2	KP81	L1	9/1/2019 1:15:13 AM	5-0369.dam	AC_09012019_5-369.wiff
	3	KP82	L2	9/1/2019 1:26:01 AM	5-0369.dam	AC_09012019_5-369.wiff
	4	KP83	L3	9/1/2019 1:36:46 AM	5-0369.dam	AC_09012019_5-369.wiff
	5	KP84	L4	9/1/2019 1:47:34 AM	5-0369.dam	AC_09012019_5-369.wiff
	6	KP85	L5	9/1/2019 1:58:21 AM	5-0369.dam	AC_09012019_5-369.wiff
	7	KP86	L6	9/1/2019 2:09:07 AM	5-0369.dam	AC_09012019_5-369.wiff
	8	KP87	L7	9/1/2019 2:19:54 AM	5-0369.dam	AC_09012019_5-369.wiff
	9	KP88 IB	IB	9/1/2019 2:30:39 AM	5-0369.dam	AC_09012019_5-369.wiff
	10	KP89 ICC	ICC	9/1/2019 2:41:25 AM	5-0369.dam	AC_09012019_5-369.wiff
	11	KP90 Branch	Branched Standard	9/1/2019 2:52:14 AM	5-0369.dam	AC_09012019_5-369.wiff
	12	MeOH		9/1/2019 3:03:00 AM	5-0369.dam	AC_09012019_5-369.wiff
1	~~13~~	~~KQ08/09 CHK1~~		~~9/1/2019 3:13:46 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~14~~	~~KQ08/09 CHK2~~		~~9/1/2019 3:24:34 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~15~~	~~KP84 CCV~~		~~9/1/2019 3:35:22 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~16~~	~~MeOH~~		~~9/1/2019 3:46:08 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~17~~	~~CV224PB-FS(0)~~		~~9/1/2019 3:56:54 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~18~~	~~CV225LCS-FS(0)~~		~~9/1/2019 4:07:41 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~19~~	~~I5145-FS1(0)~~		~~9/1/2019 4:18:27 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~20~~	~~I5145-FS1-D(3)~~		~~9/1/2019 4:29:15 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~21~~	~~I5145-FS1-D(5)~~		~~9/1/2019 4:40:03 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~22~~	~~I5145-FS1-D(7)~~		~~9/1/2019 4:50:51 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~23~~	~~I5145-FS1-D(9)~~		~~9/1/2019 5:01:38 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	24	KP85 CCV	CCV	9/1/2019 5:12:25 AM	5-0369.dam	AC_09012019_5-369.wiff
	25	MeOH		9/1/2019 5:23:13 AM	5-0369.dam	AC_09012019_5-369.wiff
	26	CV125PB-FS(0)	Procedural Blank	9/1/2019 5:34:01 AM	5-0369.dam	AC_09012019_5-369.wiff
	27	CV126LCS-FS(0)	Laboratory Control Sample	9/1/2019 5:44:48 AM	5-0369.dam	AC_09012019_5-369.wiff
	28	I6197-FS(0)	NSP-MW-02-20190812	9/1/2019 5:55:36 AM	5-0369.dam	AC_09012019_5-369.wiff
	29	I6197-FS-D(3)	NSP-MW-02-20190812	9/1/2019 6:06:24 AM	5-0369.dam	AC_09012019_5-369.wiff
3	~~30~~	~~I6197-FS-D(5)~~	~~NSP-MW-02-20190812~~	~~9/1/2019 6:17:12 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	31	I6198-FS(0)	NSP-MW-03-20190812	9/1/2019 6:28:00 AM	5-0369.dam	AC_09012019_5-369.wiff
	32	I6198-FS-D(3)	NSP-MW-03-20190812	9/1/2019 6:38:48 AM	5-0369.dam	AC_09012019_5-369.wiff
	33	I6198-FS-D(5)	NSP-MW-03-20190812	9/1/2019 6:49:37 AM	5-0369.dam	AC_09012019_5-369.wiff
	34	KP84 CCV	CCV	9/1/2019 7:00:24 AM	5-0369.dam	AC_09012019_5-369.wiff
	35	MeOH		9/1/2019 7:11:11 AM	5-0369.dam	AC_09012019_5-369.wiff
	36	I6199-FS(0)	NSP-MW-04-20190812	9/1/2019 7:22:00 AM	5-0369.dam	AC_09012019_5-369.wiff
	37	I6199-FS-D(3)	NSP-MW-04-20190812	9/1/2019 7:32:48 AM	5-0369.dam	AC_09012019_5-369.wiff
3	~~38~~	~~I6199-FS-D(5)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 7:43:35 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
3	~~39~~	~~I6199-FS-D(7)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 7:54:23 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~

BATTELLE

Sequence Report

Created with Analyst Reporter
Printed: 04/09/2019 12:55:55 PM

	Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File
3	~~40~~	~~I6199-FS-D(9)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 8:05:10 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	41	I6200-FS(0)	NSP-MW-07-20190812	9/1/2019 8:15:58 AM	5-0369.dam	AC_09012019_5-369.wiff
	42	I6201-FS(0)	NSP-MW-08-20190812	9/1/2019 8:26:47 AM	5-0369.dam	AC_09012019_5-369.wiff
	43	I6201-FS-D(3)	NSP-MW-08-20190812	9/1/2019 8:37:35 AM	5-0369.dam	AC_09012019_5-369.wiff
	44	I6203-FS(0)	NSP-Driller Water-20190810	9/1/2019 8:48:23 AM	5-0369.dam	AC_09012019_5-369.wiff
	45	KP85 CCV	CCV	9/1/2019 8:59:12 AM	5-0369.dam	AC_09012019_5-369.wiff
	46	MeOH		9/1/2019 9:09:59 AM	5-0369.dam	AC_09012019_5-369.wiff
2	~~47~~	~~I6204-FS(0)~~	~~NSP-FB-03-20190812~~	~~9/1/2019 9:20:47 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	48	I6205-FS(0)	NSP-EB-01-20190812	9/1/2019 9:31:34 AM	5-0369.dam	AC_09012019_5-369.wiff
	49	I6199MS-FS(0)	NSP-MW-04-20190812	9/1/2019 9:42:21 AM	5-0369.dam	AC_09012019_5-369.wiff
	50	I6199MS-FS-D(3)	NSP-MW-04-20190812	9/1/2019 9:53:09 AM	5-0369.dam	AC_09012019_5-369.wiff
3	~~51~~	~~I6199MS-FS-D(5)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 10:04:00 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
↓	~~52~~	~~I6199MS-FS-D(7)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 10:14:47 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~53~~	~~I6119MS-FS-D(9)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 10:25:35 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	54	KP84 CCV	CCV	9/1/2019 10:36:23 AM	5-0369.dam	AC_09012019_5-369.wiff
	1	MeOH		9/1/2019 10:47:11 AM	5-0369.dam	AC_09012019_5-369.wiff
	2	I6199MSD-FS(0)	NSP-MW-04-20190812	9/1/2019 10:58:00 AM	5-0369.dam	AC_09012019_5-369.wiff
	3	I6199MSD-FS-D(3)	NSP-MW-04-20190812	9/1/2019 11:08:47 AM	5-0369.dam	AC_09012019_5-369.wiff
3	~~4~~	~~I6199MSD-FS-D(5)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 11:19:36 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
↓	~~5~~	~~I6199MSD-FS-D(7)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 11:30:25 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	~~6~~	~~I6199MSD-FS-D(9)~~	~~NSP-MW-04-20190812~~	~~9/1/2019 11:41:12 AM~~	~~5-0369.dam~~	~~AC_09012019_5-369.wiff~~
	7	I6202-FS(0)	NSP-DUP-01-20190812	9/1/2019 11:52:01 AM	5-0369.dam	AC_09012019_5-369.wiff
	8	I6202-FS-D(3)	NSP-DUP-01-20190812	9/1/2019 12:02:50 PM	5-0369.dam	AC_09012019_5-369.wiff
	9	I6202-FS-D(5)	NSP-DUP-01-20190812	9/1/2019 12:13:39 PM	5-0369.dam	AC_09012019_5-369.wiff
	10	I6202-FS-D(7)	NSP-DUP-01-20190812	9/1/2019 12:24:27 PM	5-0369.dam	AC_09012019_5-369.wiff
	45	KP85 CCV	CCV	9/1/2019 12:35:16 PM	5-0369.dam	AC_09012019_5-369.wiff

1 Samples do not apply to this batch. LMG 9/4/19

2 Sample was reanalyzed due an internal standard area outside of criteria. The reanalysis was acceptable and was reported. Data may be found in the Unused Data folder. LMG 9/4/19

3 Dilutions were not needed and not reported. LMG 9/4/19

BATTELLE

Sequence Report

Created with Analyst Reporter
Printed: 04/09/2019 12:47:40 PM

	Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File
	1	MEOH		9/2/2019 12:51:47 PM	5-0369.dam	AC_09022019_5-369.wiff
	3	KP84 ISC	ISC	9/2/2019 1:02:34 PM	5-0369.dam	AC_09022019_5-369.wiff
	4	KP87 L7	L7	9/2/2019 1:13:21 PM	5-0369.dam	AC_09022019_5-369.wiff
	5	KP88 IB	IB	9/2/2019 1:24:07 PM	5-0369.dam	AC_09022019_5-369.wiff
	6	I6204-FS(0)	NSP-FB-03-20190812	9/2/2019 1:34:53 PM	5-0369.dam	AC_09022019_5-369.wiff
1	~~7~~	~~I5154-FS1(0)~~		~~9/2/2019 1:45:39 PM~~	~~5-0369.dam~~	~~AC_09022019_5-369.wiff~~
1	~~8~~	~~I5154-FS1-D(3)~~		~~9/2/2019 1:56:26 PM~~	~~5-0369.dam~~	~~AC_09022019_5-369.wiff~~
	9	MEOH		9/2/2019 2:07:11 PM	5-0369.dam	AC_09022019_5-369.wiff
	10	MEOH		9/2/2019 2:17:56 PM	5-0369.dam	AC_09022019_5-369.wiff
	11	MEOH		9/2/2019 2:28:44 PM	5-0369.dam	AC_09022019_5-369.wiff
	12	KP85 CCV	CCV	9/2/2019 2:39:32 PM	5-0369.dam	AC_09022019_5-369.wiff

1 Samples do not apply to this batch. LMG 9/4/19

BATTELLE

Sequence Report

Created with Analyst Reporter
Printed: 04/09/2019 12:50:50 PM

	Vial	Laboratory Sample ID	Client Sample ID	Acquisition Date	Acquisition Method	Data File
	5	KP81	L1	9/3/2019 12:26:18 PM	5-0369.dam	AC_09032019_5-369.wiff
	6	KP82	L2	9/3/2019 12:37:05 PM	5-0369.dam	AC_09032019_5-369.wiff
	7	KP83	L3	9/3/2019 12:47:51 PM	5-0369.dam	AC_09032019_5-369.wiff
	8	KP84	L4	9/3/2019 12:58:39 PM	5-0369.dam	AC_09032019_5-369.wiff
	9	KP85	L5	9/3/2019 1:09:26 PM	5-0369.dam	AC_09032019_5-369.wiff
	10	KP86	L6	9/3/2019 1:20:13 PM	5-0369.dam	AC_09032019_5-369.wiff
	11	KP87	L7	9/3/2019 1:31:00 PM	5-0369.dam	AC_09032019_5-369.wiff
	12	KP88 IB	IB	9/3/2019 1:41:46 PM	5-0369.dam	AC_09032019_5-369.wiff
	13	KP89 ICC	ICC	9/3/2019 1:52:33 PM	5-0369.dam	AC_09032019_5-369.wiff
	14	KP90 BRANCHED	Branched Standard	9/3/2019 2:03:20 PM	5-0369.dam	AC_09032019_5-369.wiff
	15	KQ27-CHK2-1		9/3/2019 2:14:07 PM	5-0369.dam	AC_09032019_5-369.wiff
	16	KQ27-CHK2-1		9/3/2019 2:24:53 PM	5-0369.dam	AC_09032019_5-369.wiff
1	~~17~~	~~KP85 CCV~~	~~CCV~~	~~9/3/2019 2:36:13 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
	18	I6199-FS-D(11)	NSP-MW-04-20190812	9/3/2019 2:46:59 PM	5-0369.dam	AC_09032019_5-369.wiff
2	~~19~~	~~I6199-FS-D(13)~~	~~NSP-MW-04-20190812~~	~~9/3/2019 2:57:47 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
	20	I6199MS-FS-D(11)	NSP-MW-04-20190812	9/3/2019 3:08:34 PM	5-0369.dam	AC_09032019_5-369.wiff
2	~~21~~	~~I6199MS-FS-D(13)~~	~~NSP-MW-07-20190812~~	~~9/3/2019 3:19:22 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
	22	I6199MSD-FS-D(11)	NSP-MW-04-20190812	9/3/2019 3:30:09 PM	5-0369.dam	AC_09032019_5-369.wiff
2	~~23~~	~~I6199MSD-FS-D(13)~~	~~NSP-MW-07-20190812~~	~~9/3/2019 3:40:56 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
↓	~~24~~	~~I6200-FS-D(3)~~	~~NSP-MW-07-20190812~~	~~9/3/2019 3:51:42 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
	~~25~~	~~I6200-FS-D(5)~~	~~NSP-MW-07-20190812~~	~~9/3/2019 4:02:30 PM~~	~~5-0369.dam~~	~~AC_09032019_5-369.wiff~~
	26	I6200-FS-D(7)	NSP-MW-07-20190812	9/3/2019 4:13:16 PM	5-0369.dam	AC_09032019_5-369.wiff
	28	KP84 CCV	CCV	9/3/2019 4:24:03 PM	5-0369.dam	AC_09032019_5-369.wiff
	3	MEOH		9/4/2019 9:07:13 AM	5-0369.dam	AC_09032019_5-369.wiff
	4	KP84 CCV	CCV	9/4/2019 9:18:00 AM	5-0369.dam	AC_09032019_5-369.wiff
	5	I6200-FS-D(9)	NSP-MW-07-20190812	9/4/2019 9:28:49 AM	5-0369.dam	AC_09032019_5-369.wiff
	6	I6200-FS-D(11)	NSP-MW-07-20190812	9/4/2019 9:39:36 AM	5-0369.dam	AC_09032019_5-369.wiff
	7	MEOH		9/4/2019 9:50:22 AM	5-0369.dam	AC_09032019_5-369.wiff
	8	KP85 CCV	CCV	9/4/2019 10:01:09 AM	5-0369.dam	AC_09032019_5-369.wiff
	9	MEOH		9/4/2019 10:11:55 AM	5-0369.dam	AC_09032019_5-369.wiff
	1	I6200-FS-D(13)	NSP-MW-07-20190812	9/4/2019 10:45:00 AM	5-0369.dam	AC_09032019_5-369.wiff
	8	KP85 CCV	CCV	9/4/2019 10:55:48 AM	5-0369.dam	AC_09032019_5-369.wiff

1 CCV exhibited a bad injection which resulted in low responses for all internal standards, surrogates, and native analytes. While the CCV passed for surrogate and native analyte recoveries, where the internal standard responses did not meet criteria it was not used for this batch. The ICC was used instead to bracket the samples following this CCV, since there were not more than ten authentic field samples between it and the next acceptable CCV. Data may be found in the Unused Data folder. LMG 9/4/19

2 Dilutions were not needed and were not reported. LMG 9/4/19

BATTELLE

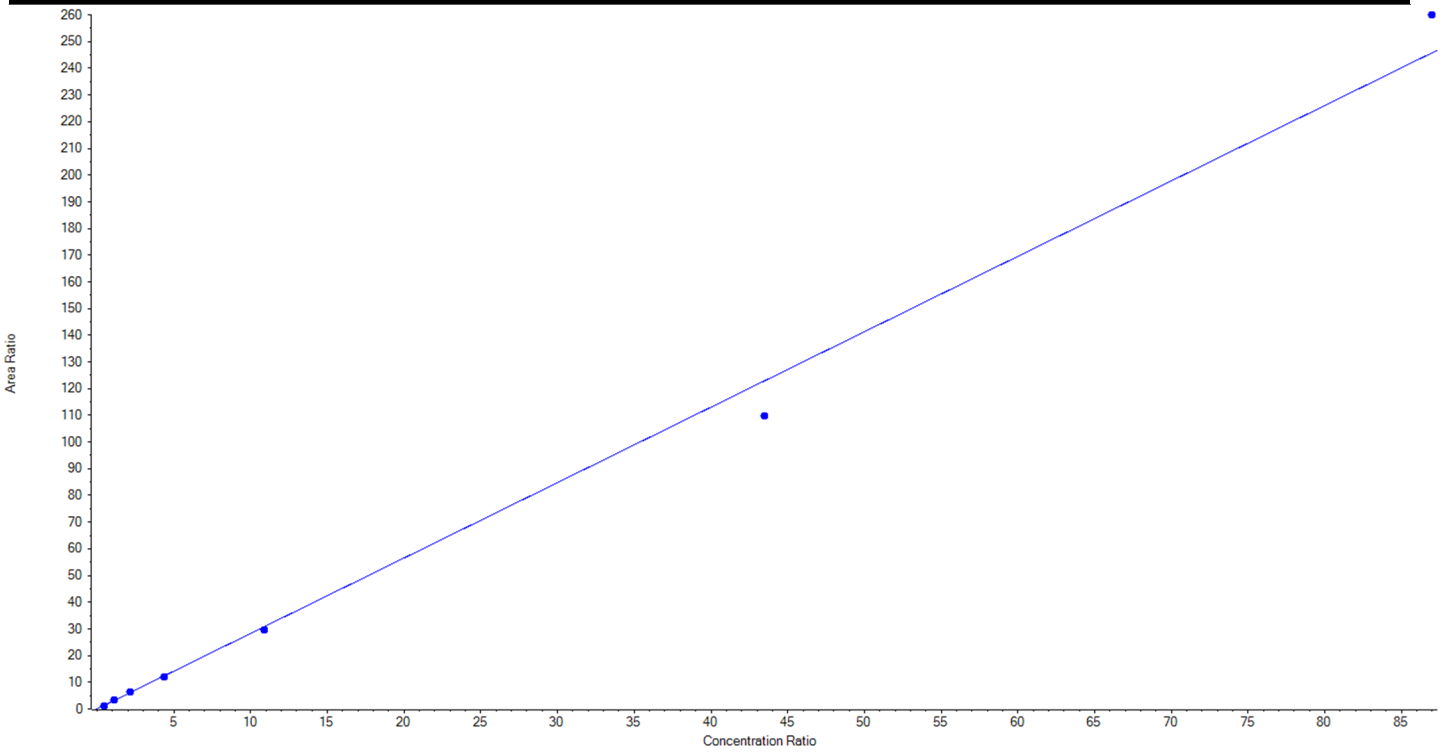
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFBS_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	298.9 / 80.0	**Result Table**	19-0746
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 2.82540 x + 0.04684 (r = 0.99705) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	103.70	102.7
3	KP82	L2	True	252.50	270.98	107.3
4	KP83	L3	True	505.00	511.00	101.2
5	KP84	L4	True	1010.00	984.80	97.5
6	KP85	L5	True	2525.00	2428.78	96.2
7	KP86	L6	True	10100.00	9022.41	89.3
8	KP87	L7	True	20200.00	21371.85	105.8



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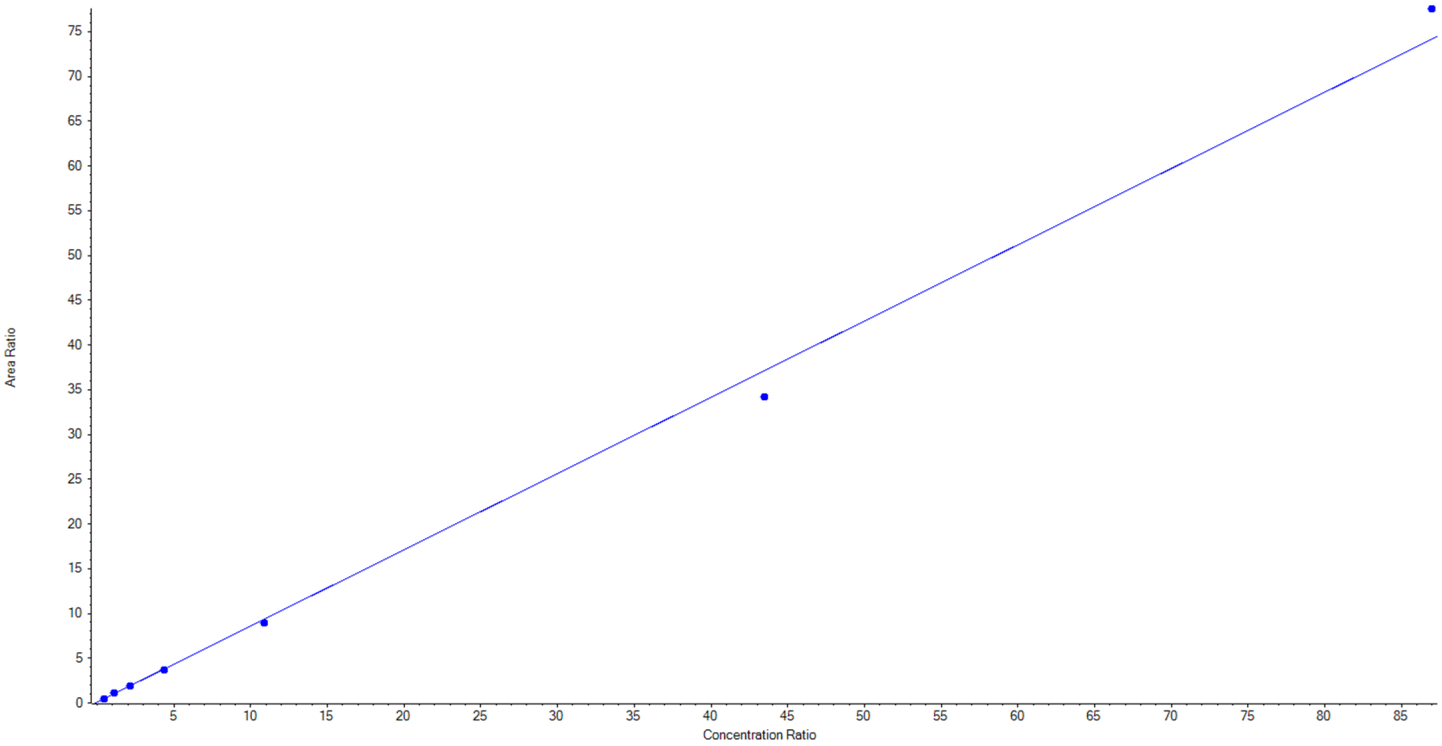
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFBS_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	298.9 / 99.0	**Result Table**	19-0746
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.85191 x + 0.07686 (r = 0.99812) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	97.20	96.2
3	KP82	L2	True	252.50	296.50	117.4
4	KP83	L3	True	505.00	492.41	97.5
5	KP84	L4	True	1010.00	973.88	96.4
6	KP85	L5	True	2525.00	2420.15	95.9
7	KP86	L6	True	10100.00	9292.36	92.0
8	KP87	L7	True	20200.00	21121.00	104.6



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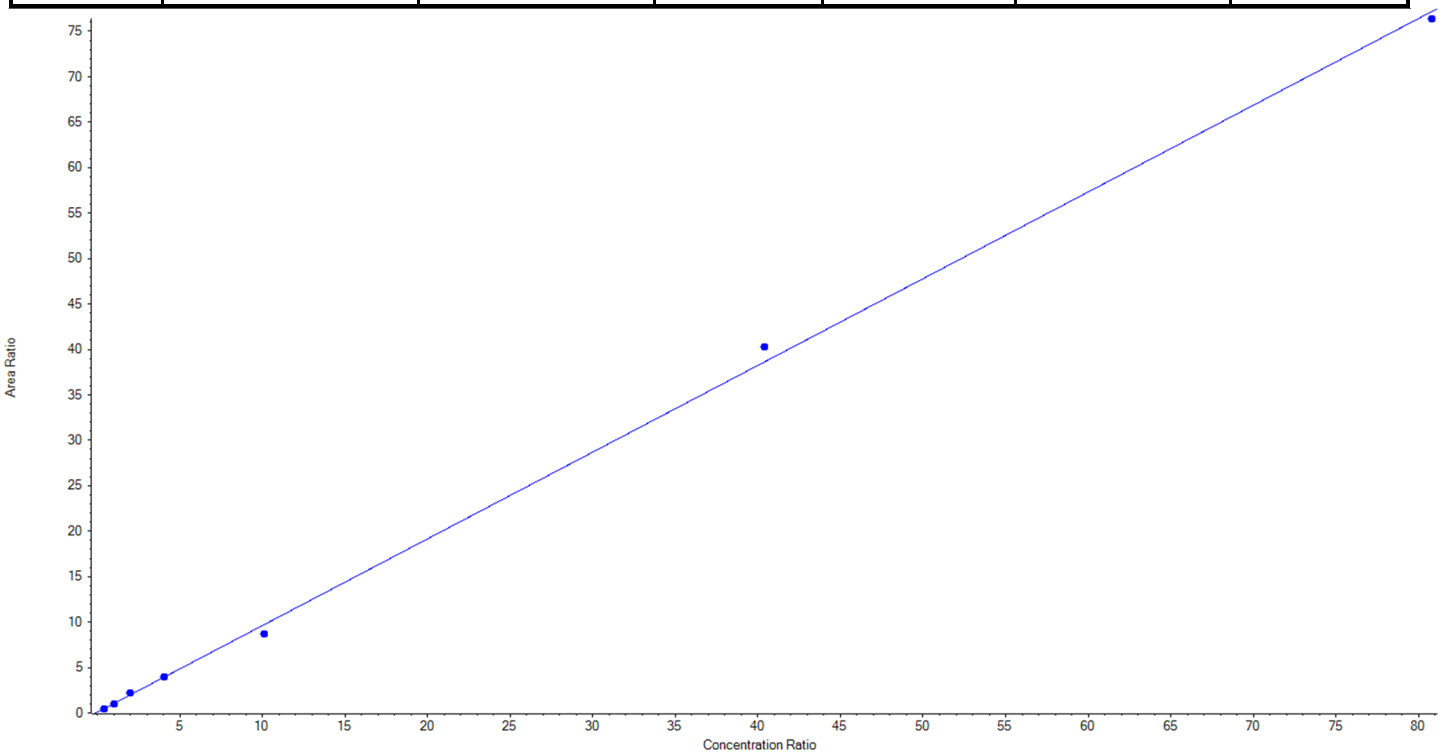
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	313.0 / 269.0	**Result Table**	19-0746
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.95430 x + 0.07002 (r = 0.99912) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	101.77	100.8
3	KP82	L2	True	252.50	246.01	97.4
4	KP83	L3	True	505.00	549.63	108.8
5	KP84	L4	True	1010.00	1016.30	100.6
6	KP85	L5	True	2525.00	2247.27	89.0
7	KP86	L6	True	10100.00	10543.35	104.4
8	KP87	L7	True	20200.00	19989.17	99.0



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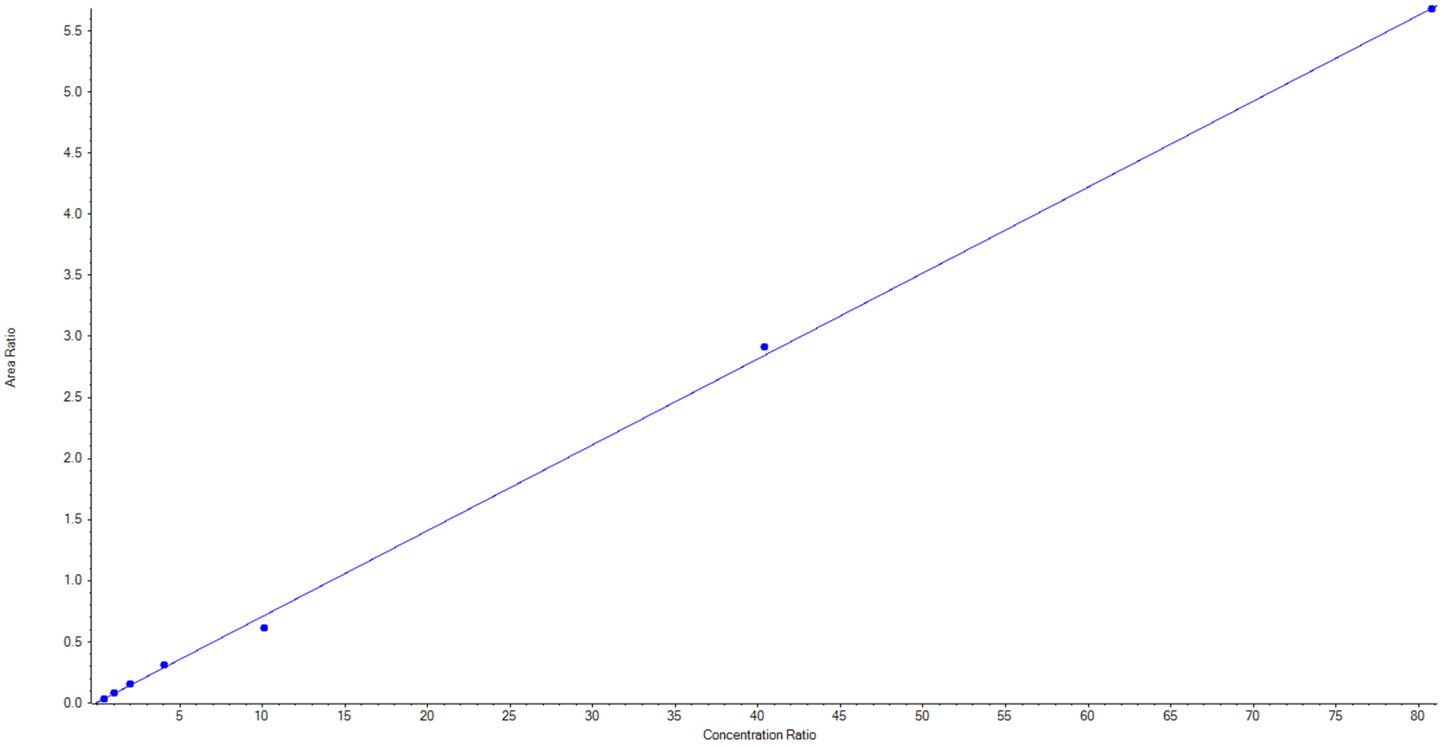
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	313.0 / 119.0	**Result Table**	19-0746
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.07030 x + 0.00410 (r = 0.99893) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	92.98	92.1
3	KP82	L2	True	252.50	264.34	104.7
4	KP83	L3	True	505.00	537.31	106.4
5	KP84	L4	True	1010.00	1098.11	108.7
6	KP85	L5	True	2525.00	2164.43	85.7
7	KP86	L6	True	10100.00	10349.77	102.5
8	KP87	L7	True	20200.00	20186.56	99.9



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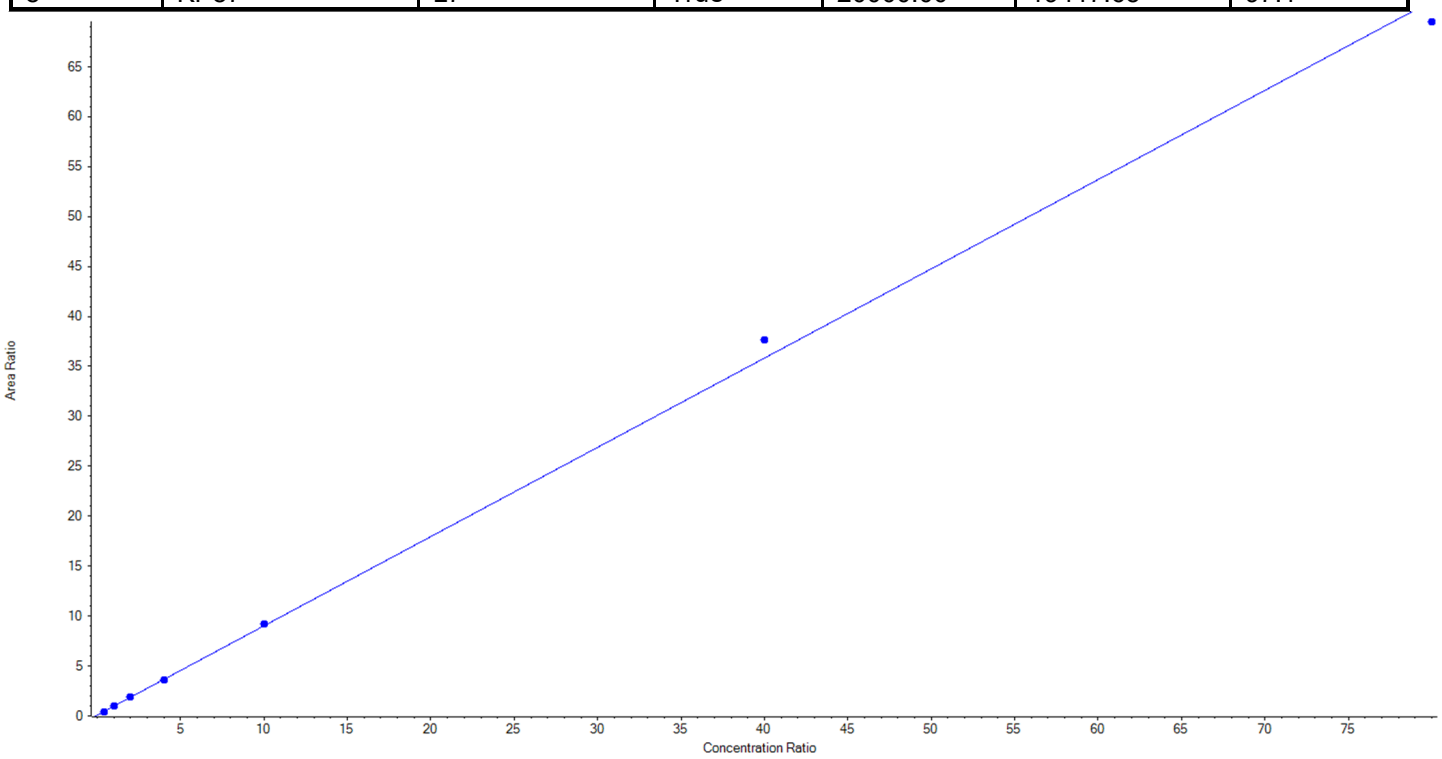
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHpA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	363.0 / 319.0	**Result Table**	19-0746
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.89366 x + 0.08631 (r = 0.99926) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	94.38	94.4
3	KP82	L2	True	250.00	246.53	98.6
4	KP83	L3	True	500.00	516.97	103.4
5	KP84	L4	True	1000.00	986.80	98.7
6	KP85	L5	True	2500.00	2565.79	102.6
7	KP86	L6	True	10000.00	10521.89	105.2
8	KP87	L7	True	20000.00	19417.65	97.1



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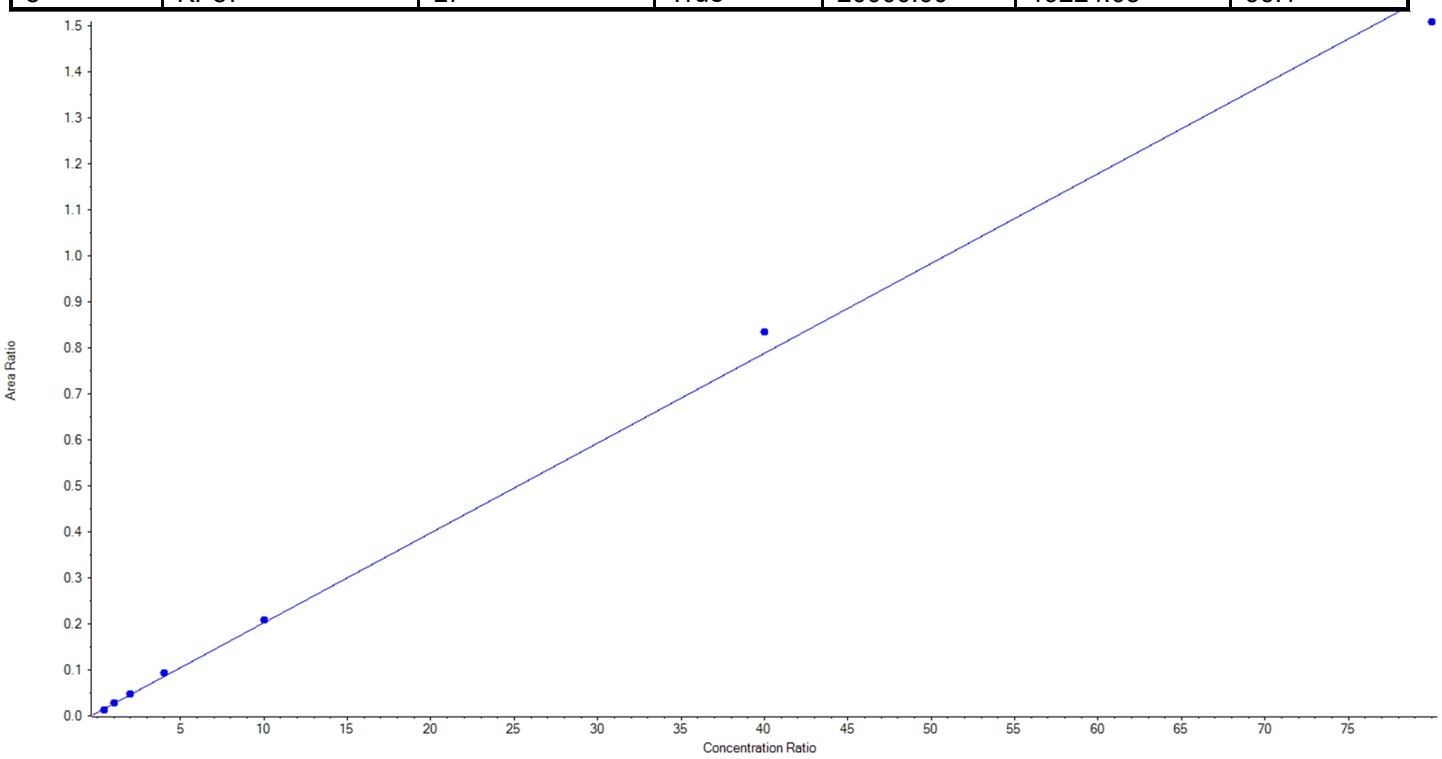
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHpA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	363.0 / 169.0	**Result Table**	19-0746
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.01952 x + 0.00737 (r = 0.99861) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	72.53	72.5
3	KP82	L2	True	250.00	278.89	111.6
4	KP83	L3	True	500.00	504.20	100.8
5	KP84	L4	True	1000.00	1096.30	109.6
6	KP85	L5	True	2500.00	2586.22	103.5
7	KP86	L6	True	10000.00	10587.85	105.9
8	KP87	L7	True	20000.00	19224.03	96.1



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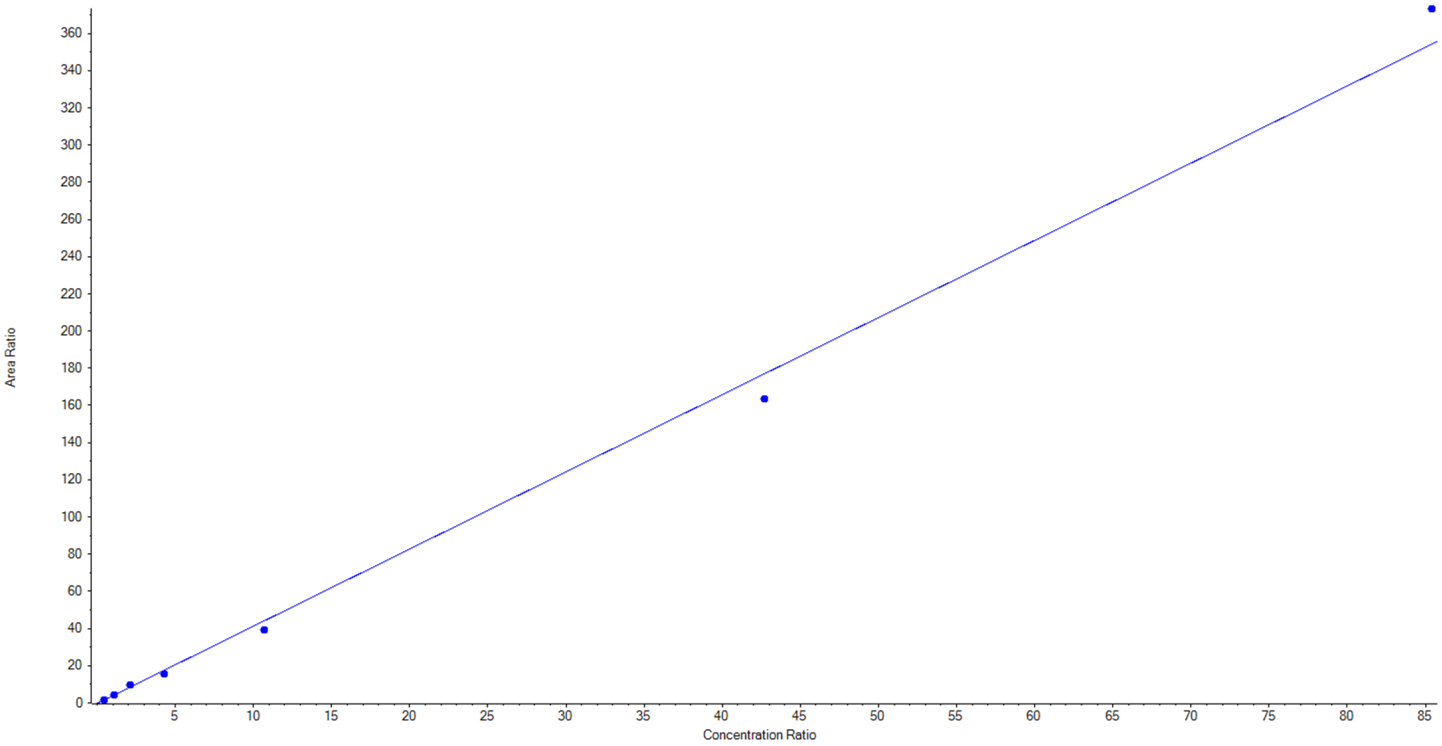
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxS_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	399.0 / 80.0	**Result Table**	19-0746
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 4.14988 x + -0.23639 (r = 0.99743) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	111.93	110.8
3	KP82	L2	True	252.50	259.46	102.8
4	KP83	L3	True	505.00	555.63	110.0
5	KP84	L4	True	1010.00	903.39	89.4
6	KP85	L5	True	2525.00	2253.46	89.3
7	KP86	L6	True	10100.00	9325.60	92.3
8	KP87	L7	True	20200.00	21284.02	105.4



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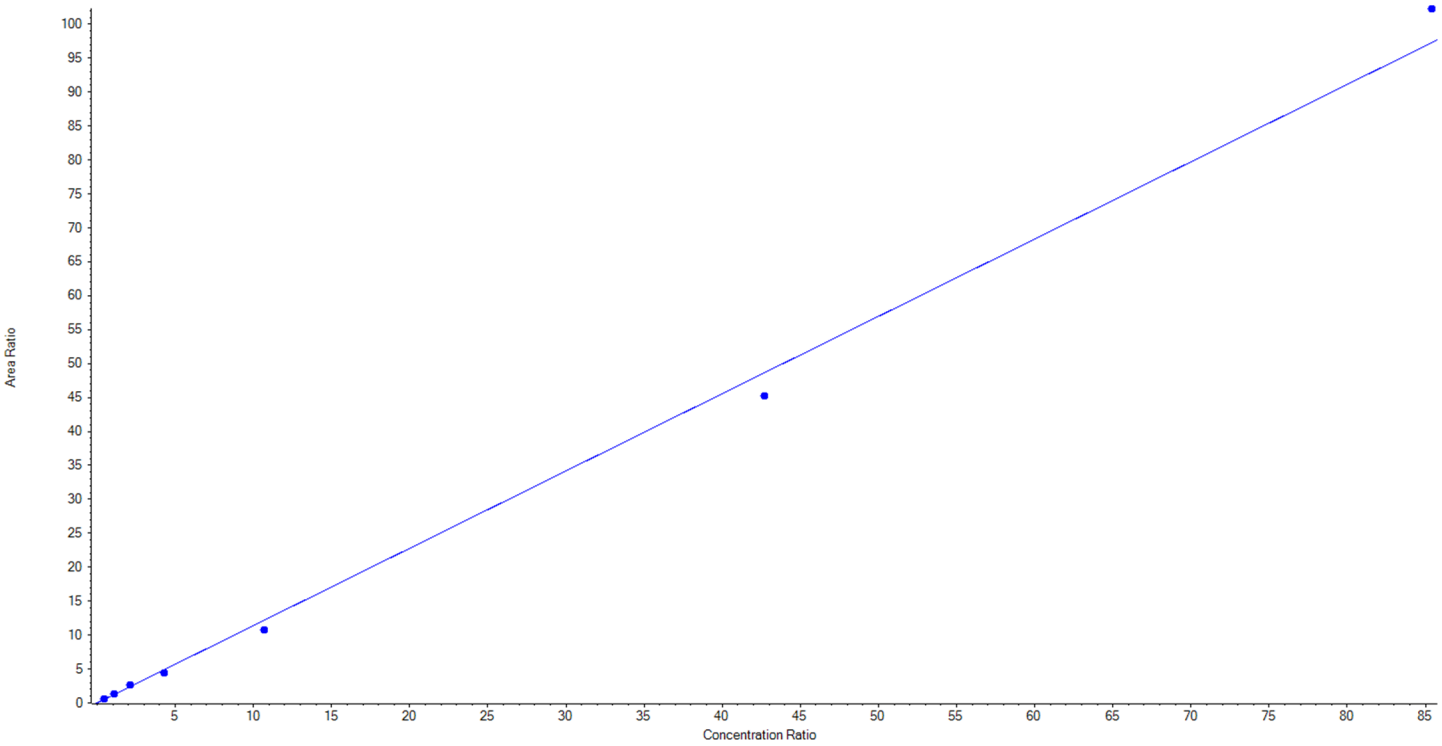
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxS_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	399.0 / 99.0	**Result Table**	19-0746
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.13893 x + 0.00843 (r = 0.99763) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	109.42	108.3
3	KP82	L2	True	252.50	269.47	106.7
4	KP83	L3	True	505.00	547.83	108.5
5	KP84	L4	True	1010.00	906.58	89.8
6	KP85	L5	True	2525.00	2237.78	88.6
7	KP86	L6	True	10100.00	9389.42	93.0
8	KP87	L7	True	20200.00	21233.01	105.1



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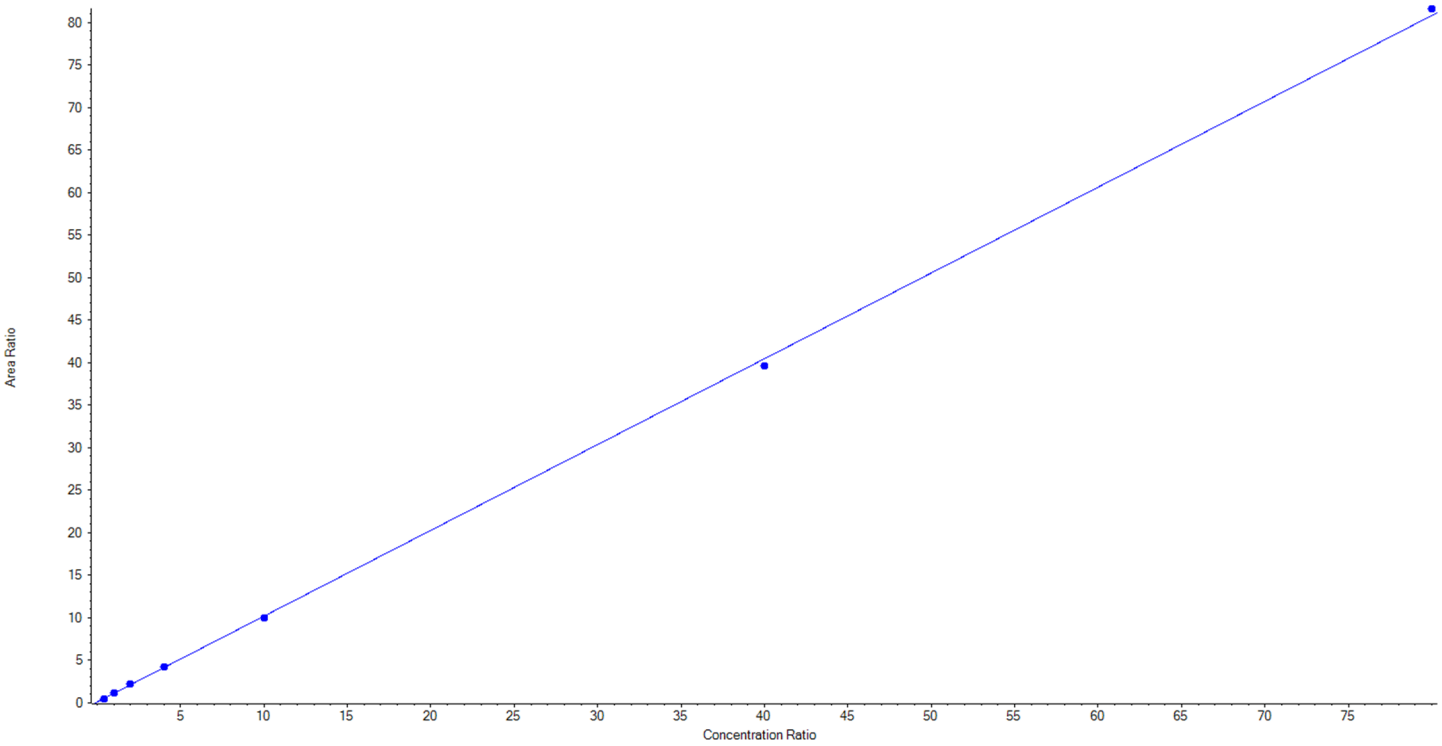
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	413.0 / 369.0	**Result Table**	19-0746
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.00915 x + 0.11739 (r = 0.99982) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	89.55	89.6
3	KP82	L2	True	250.00	261.63	104.7
4	KP83	L3	True	500.00	534.90	107.0
5	KP84	L4	True	1000.00	1014.89	101.5
6	KP85	L5	True	2500.00	2460.41	98.4
7	KP86	L6	True	10000.00	9793.68	97.9
8	KP87	L7	True	20000.00	20194.94	101.0



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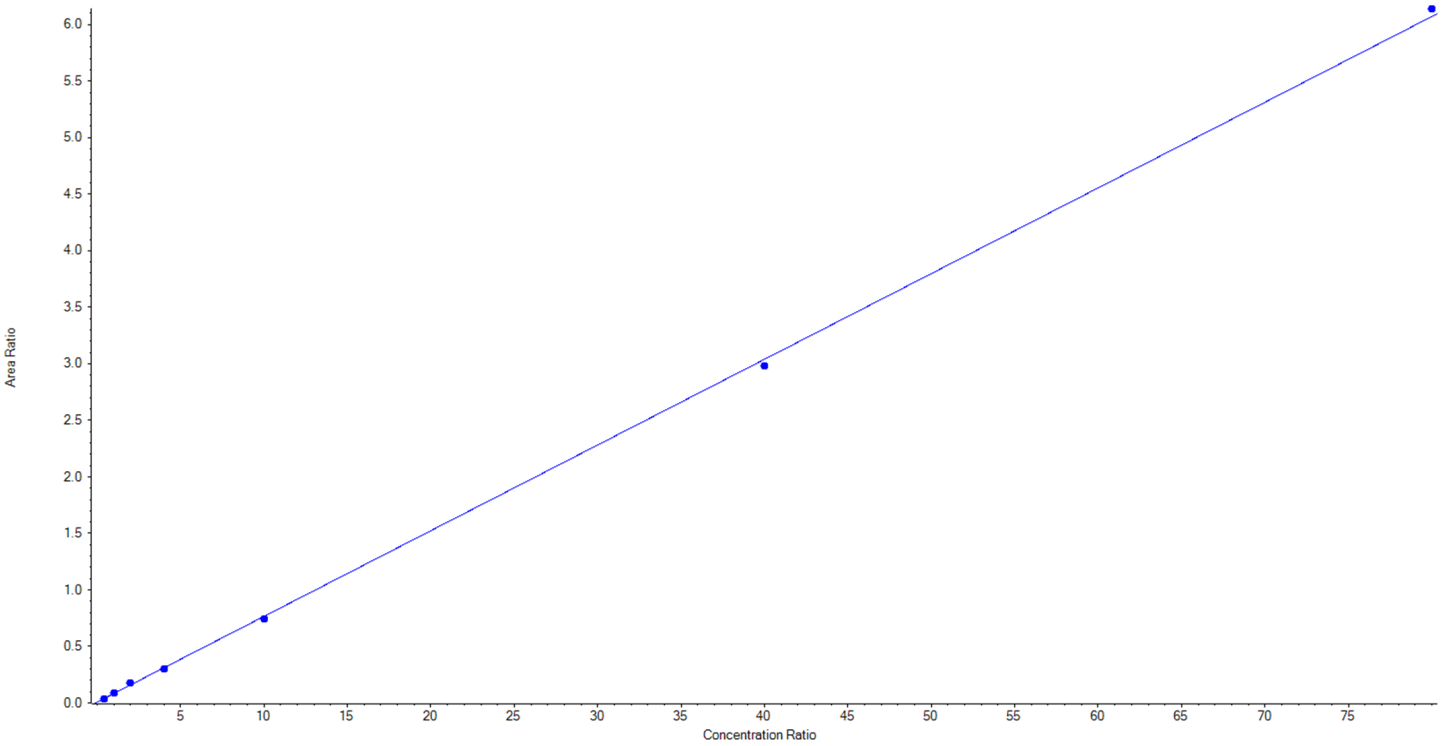
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	413.0 / 169.0	**Result Table**	19-0746
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.07579 x + 0.00770 (r = 0.99962) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	83.45	83.5
3	KP82	L2	True	250.00	278.60	111.4
4	KP83	L3	True	500.00	563.55	112.7
5	KP84	L4	True	1000.00	958.84	95.9
6	KP85	L5	True	2500.00	2432.72	97.3
7	KP86	L6	True	10000.00	9808.36	98.1
8	KP87	L7	True	20000.00	20224.48	101.1



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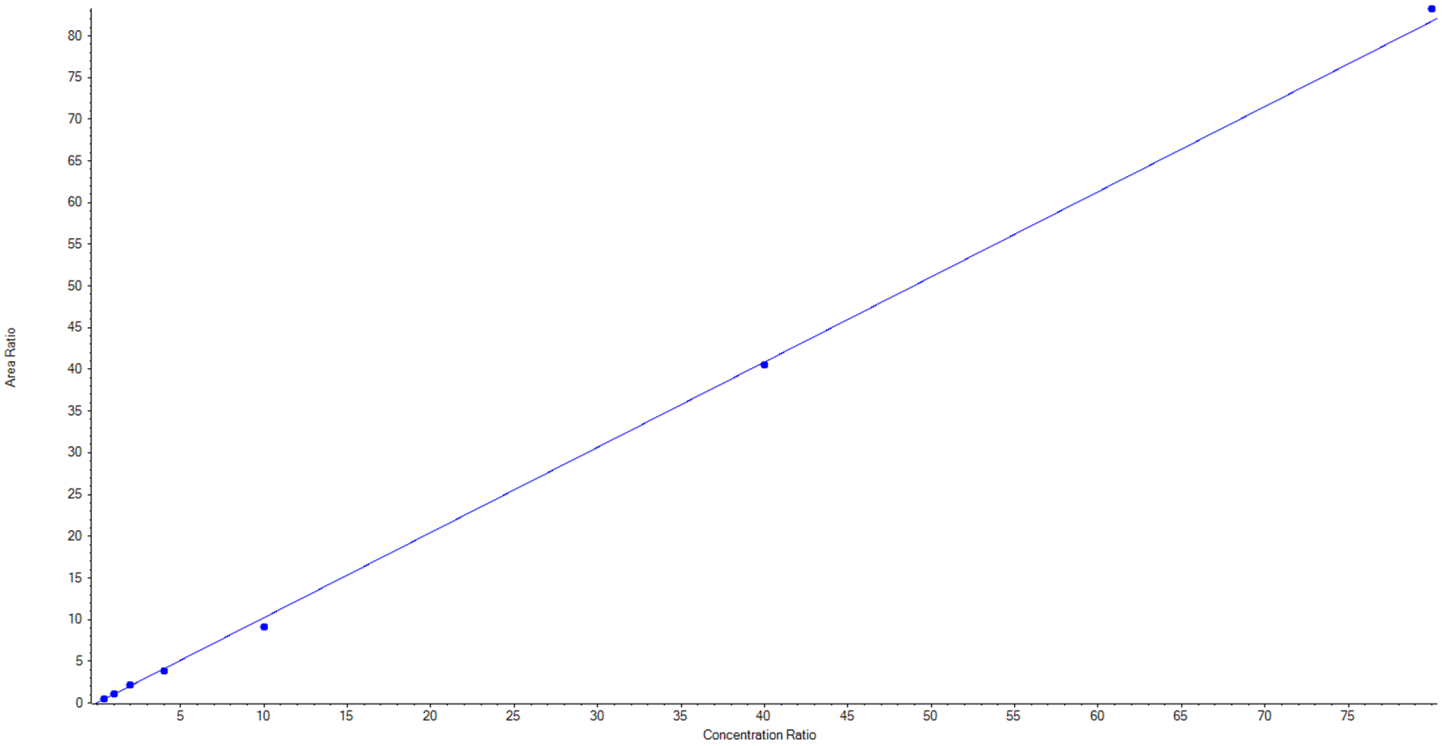
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFNA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	463.0 / 419.0	**Result Table**	19-0746
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.02149 x + 0.01352 (r = 0.99933) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	105.02	105.0
3	KP82	L2	True	250.00	270.52	108.2
4	KP83	L3	True	500.00	514.67	102.9
5	KP84	L4	True	1000.00	934.00	93.4
6	KP85	L5	True	2500.00	2233.58	89.3
7	KP86	L6	True	10000.00	9927.33	99.3
8	KP87	L7	True	20000.00	20364.89	101.8



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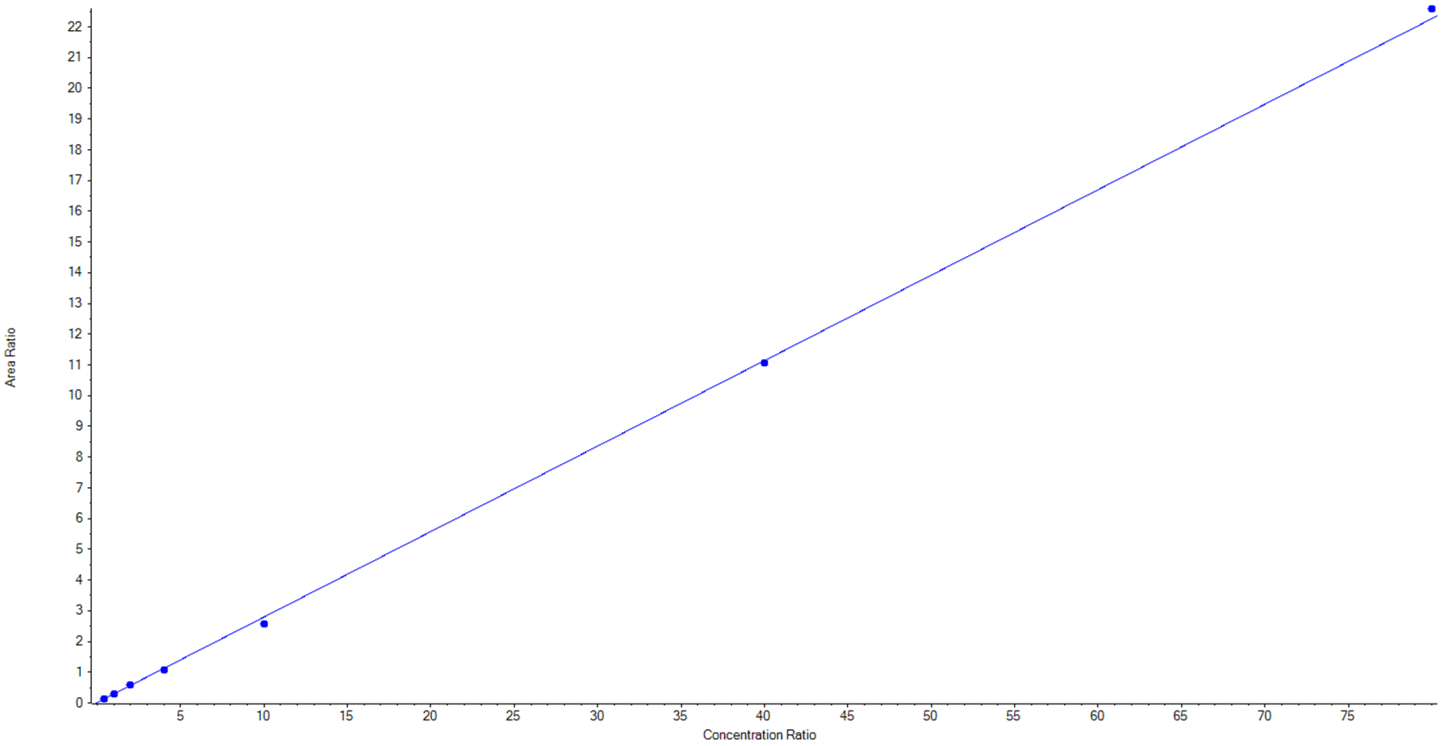
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFNA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	463.0 / 219.0	**Result Table**	19-0746
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.27813 x + 0.01440 (r = 0.99963) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	104.93	104.9
3	KP82	L2	True	250.00	262.84	105.1
4	KP83	L3	True	500.00	508.57	101.7
5	KP84	L4	True	1000.00	954.16	95.4
6	KP85	L5	True	2500.00	2301.49	92.1
7	KP86	L6	True	10000.00	9929.97	99.3
8	KP87	L7	True	20000.00	20288.03	101.4



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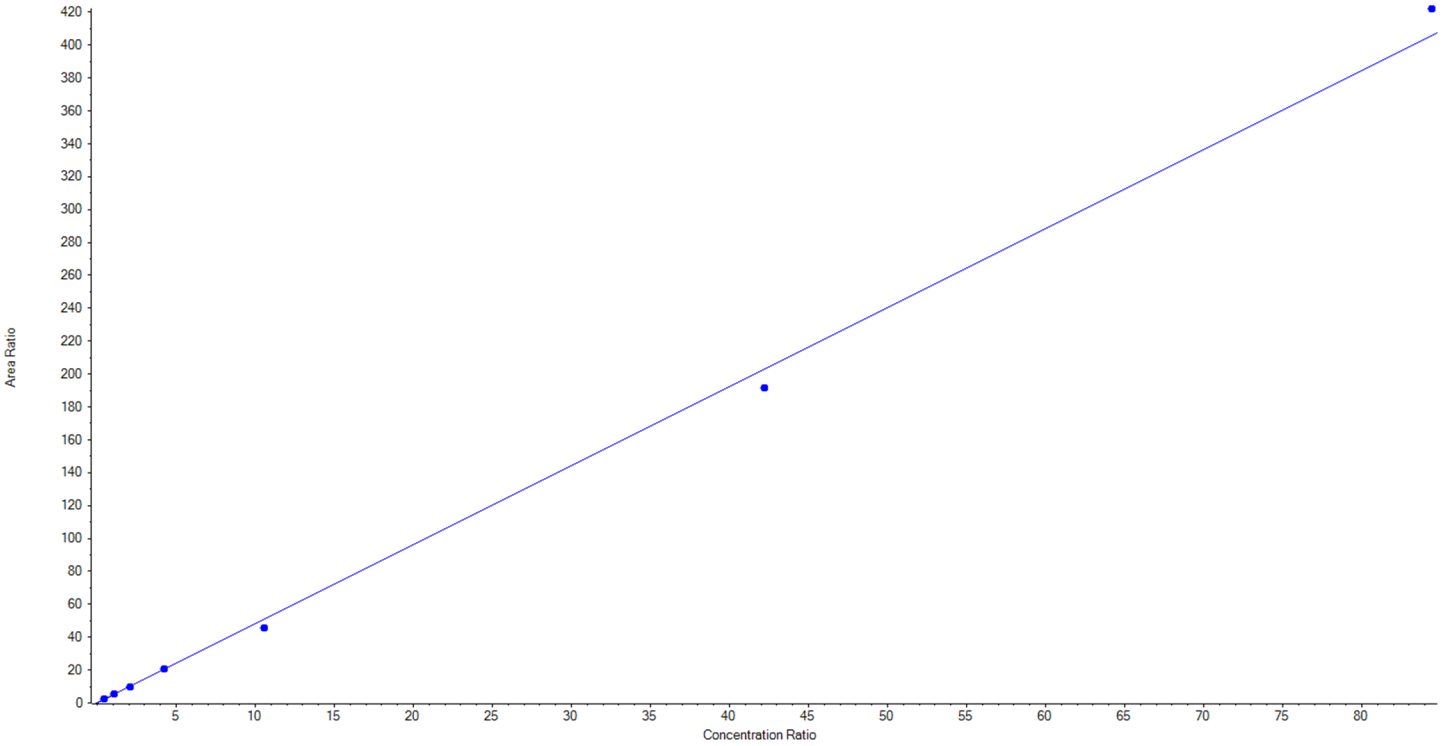
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOS_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	499.0 / 80.0	**Result Table**	19-0746
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 4.80682 x + 0.03296 (r = 0.99851) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	107.51	106.4
3	KP82	L2	True	252.50	277.99	110.1
4	KP83	L3	True	505.00	468.62	92.8
5	KP84	L4	True	1010.00	1032.86	102.3
6	KP85	L5	True	2525.00	2274.79	90.1
7	KP86	L6	True	10100.00	9527.49	94.3
8	KP87	L7	True	20200.00	21004.25	104.0



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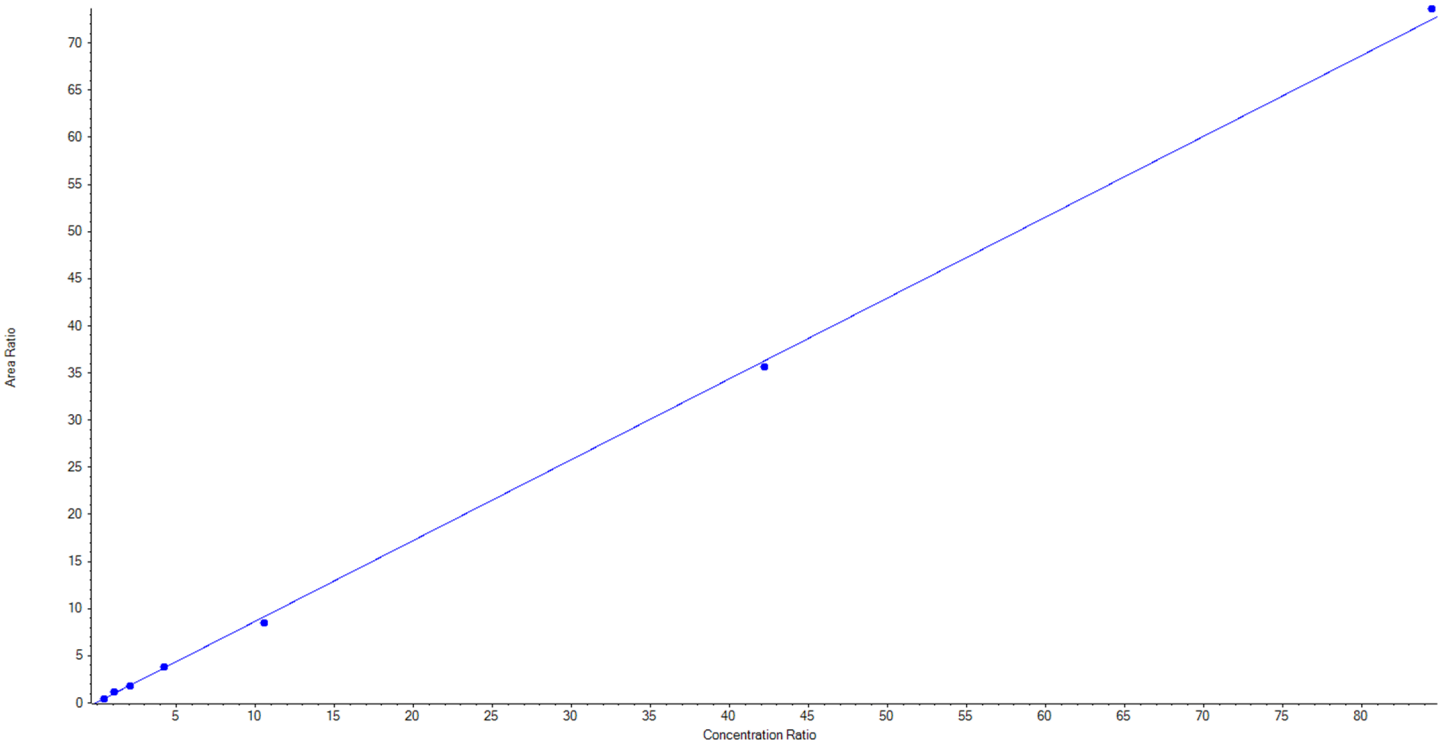
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOS_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	499.0 / 99.0	**Result Table**	19-0746
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.85754 x + 0.08142 (r = 0.99956) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	101.00	96.83	95.9
3	KP82	L2	True	252.50	288.94	114.4
4	KP83	L3	True	505.00	471.47	93.4
5	KP84	L4	True	1010.00	1042.27	103.2
6	KP85	L5	True	2525.00	2357.31	93.4
7	KP86	L6	True	10100.00	9918.61	98.2
8	KP87	L7	True	20200.00	20518.07	101.6



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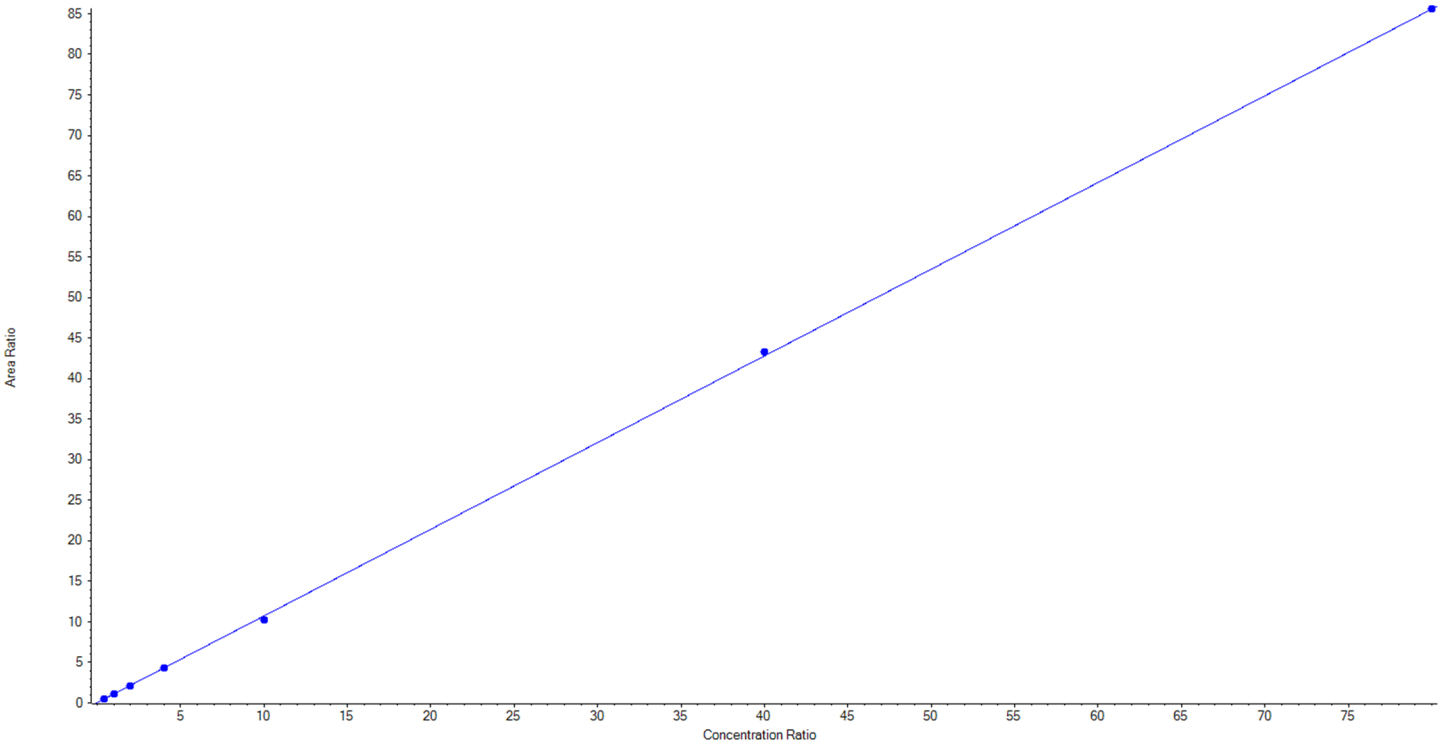
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	513.0 / 469.0	**Result Table**	19-0746
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.06927 x + 0.03656 (r = 0.99989) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	101.90	101.9
3	KP82	L2	True	250.00	260.55	104.2
4	KP83	L3	True	500.00	490.78	98.2
5	KP84	L4	True	1000.00	990.02	99.0
6	KP85	L5	True	2500.00	2389.54	95.6
7	KP86	L6	True	10000.00	10110.80	101.1
8	KP87	L7	True	20000.00	20006.41	100.0



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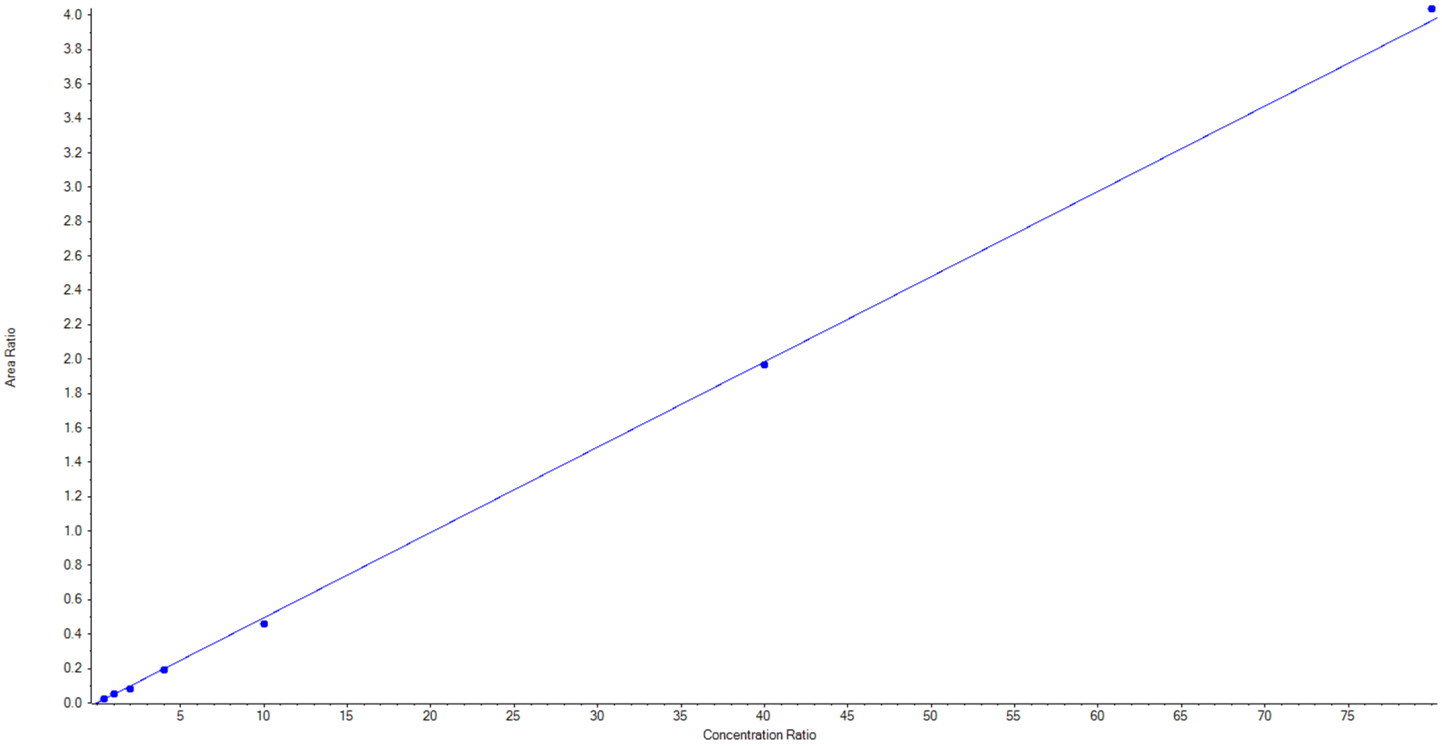
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	513.0 / 219.0	**Result Table**	19-0746
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.04960 x + 7.27593e-5 (r = 0.99929) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	122.82	122.8
3	KP82	L2	True	250.00	264.84	105.9
4	KP83	L3	True	500.00	403.46	80.7
5	KP84	L4	True	1000.00	966.31	96.6
6	KP85	L5	True	2500.00	2324.84	93.0
7	KP86	L6	True	10000.00	9918.28	99.2
8	KP87	L7	True	20000.00	20349.45	101.8



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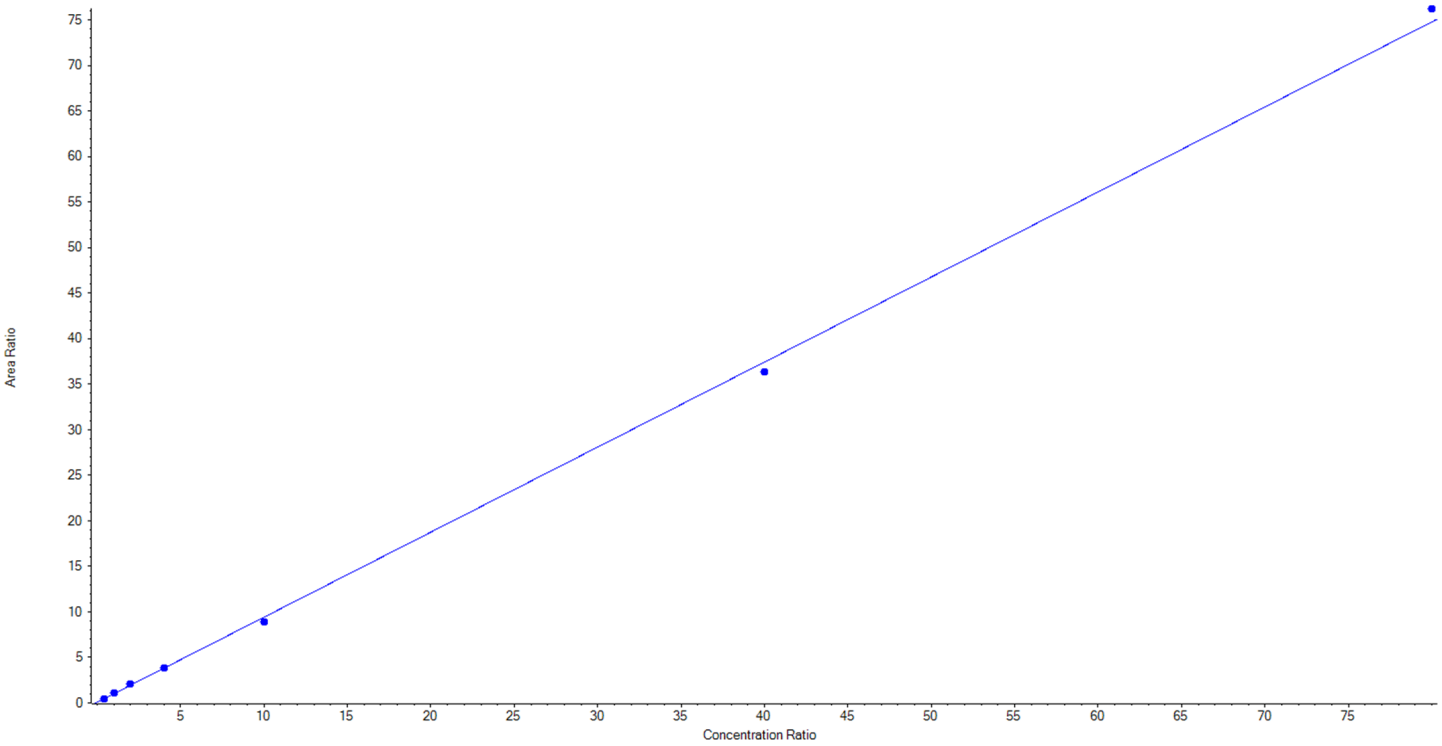
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFUnA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	563.0 / 519.0	**Result Table**	19-0746
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.93409 x + 0.07824 (r = 0.99954) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	92.67	92.7
3	KP82	L2	True	250.00	261.36	104.5
4	KP83	L3	True	500.00	544.33	108.9
5	KP84	L4	True	1000.00	1004.88	100.5
6	KP85	L5	True	2500.00	2362.57	94.5
7	KP86	L6	True	10000.00	9701.54	97.0
8	KP87	L7	True	20000.00	20382.65	101.9



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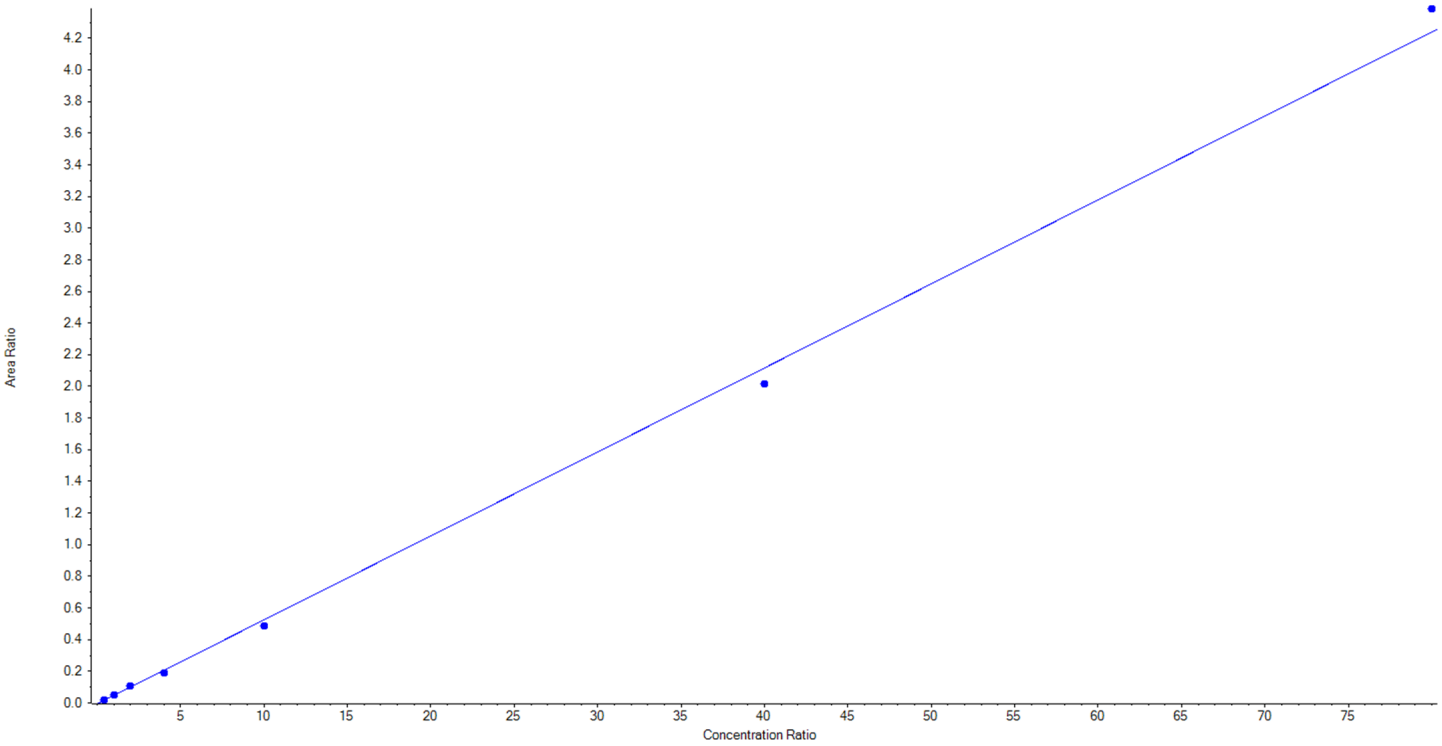
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFUnA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	563.0 / 269.0	**Result Table**	19-0746
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.05307 x + -0.00615 (r = 0.99893) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	106.63	106.6
3	KP82	L2	True	250.00	255.56	102.2
4	KP83	L3	True	500.00	533.54	106.7
5	KP84	L4	True	1000.00	932.30	93.2
6	KP85	L5	True	2500.00	2314.14	92.6
7	KP86	L6	True	10000.00	9521.50	95.2
8	KP87	L7	True	20000.00	20686.35	103.4



BATTELLE

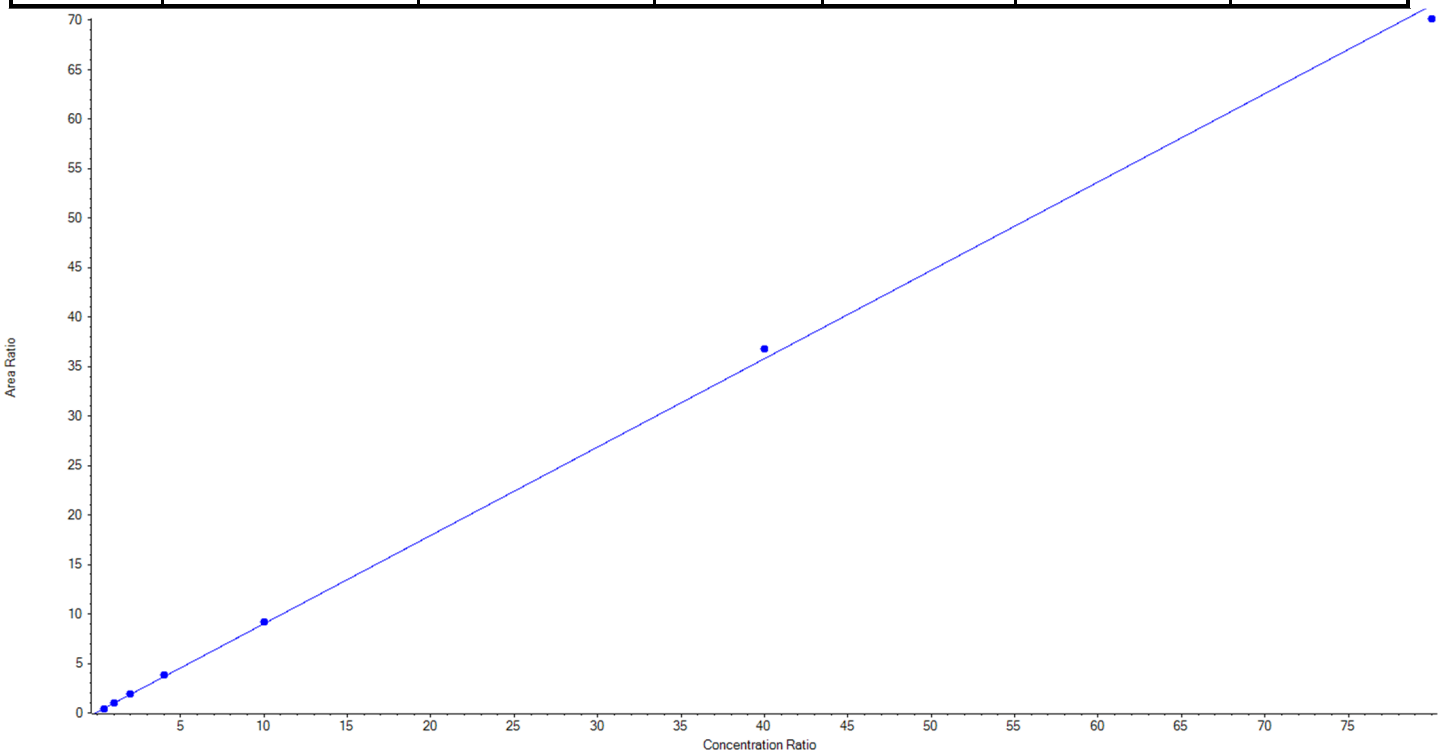
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDoA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	613.0 / 569.0	**Result Table**	19-0746
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.89289 x + 0.08681 (r = 0.99965) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	83.76	83.8
3	KP82	L2	True	250.00	265.84	106.3
4	KP83	L3	True	500.00	511.58	102.3
5	KP84	L4	True	1000.00	1045.47	104.6
6	KP85	L5	True	2500.00	2556.22	102.3
7	KP86	L6	True	10000.00	10271.10	102.7
8	KP87	L7	True	20000.00	19616.03	98.1



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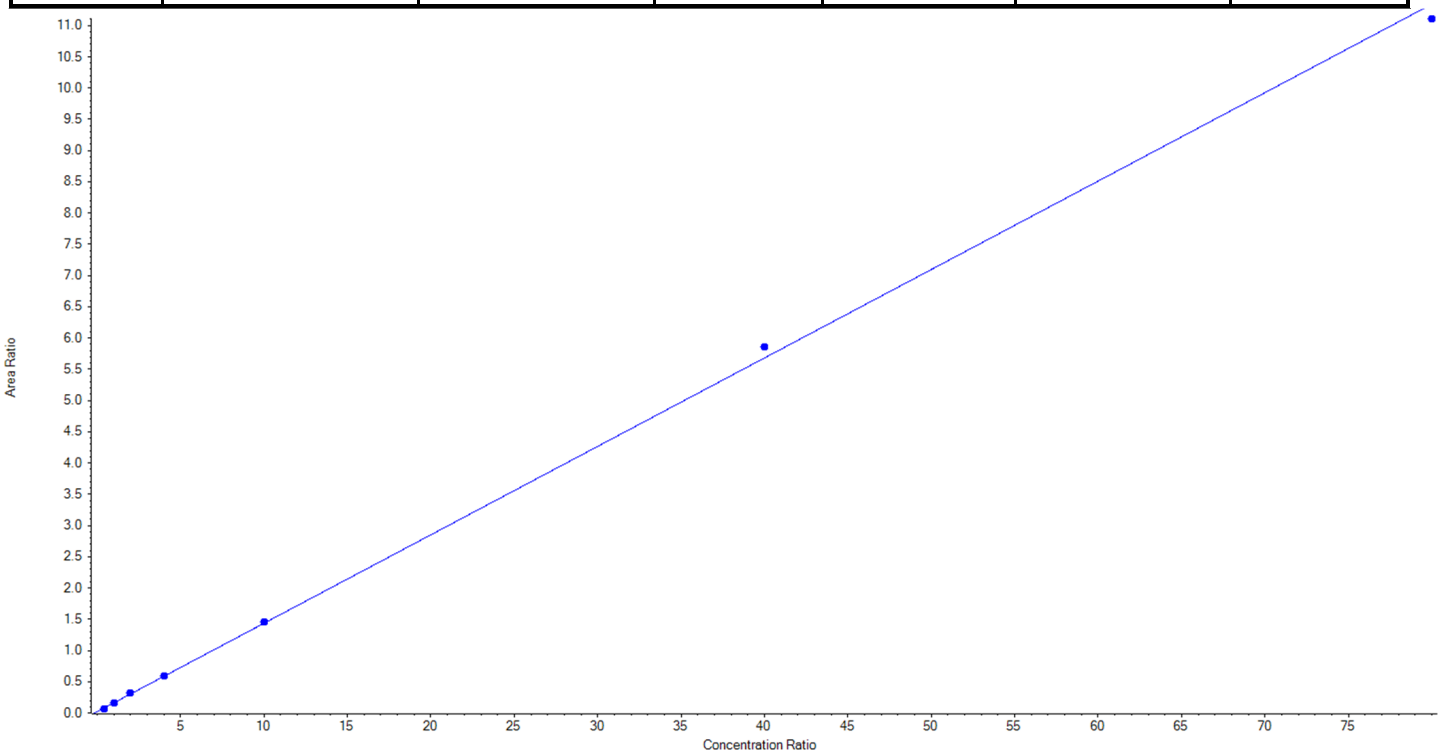
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDoA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	613.0 / 319.0	**Result Table**	19-0746
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.14151 x + 0.01990 (r = 0.99962) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	85.59	85.6
3	KP82	L2	True	250.00	261.40	104.6
4	KP83	L3	True	500.00	521.24	104.3
5	KP84	L4	True	1000.00	1024.61	102.5
6	KP85	L5	True	2500.00	2549.96	102.0
7	KP86	L6	True	10000.00	10321.13	103.2
8	KP87	L7	True	20000.00	19586.07	97.9



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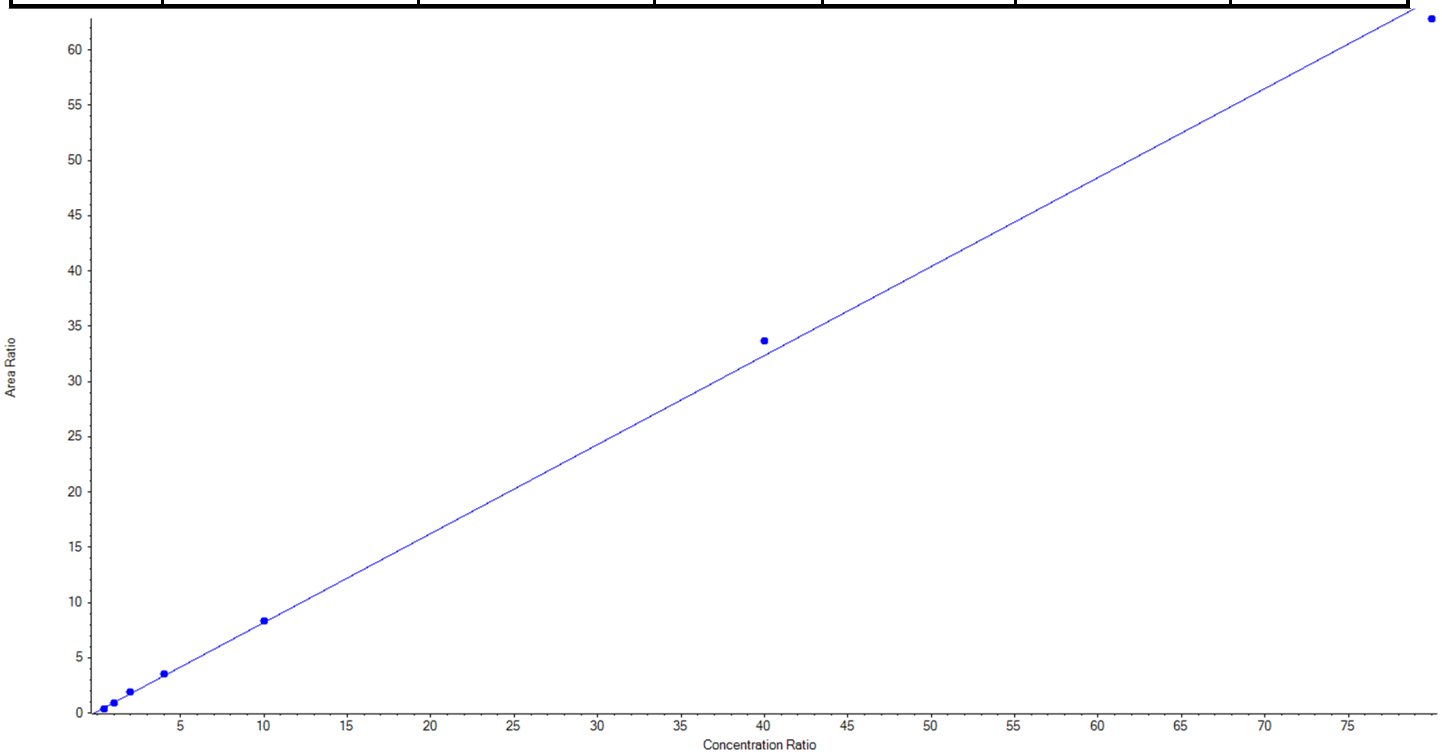
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTrDA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	663.0 / 619.0	**Result Table**	19-0746
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.80552 x + 0.12792 (r = 0.99931) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	81.62	81.6
3	KP82	L2	True	250.00	251.04	100.4
4	KP83	L3	True	500.00	546.36	109.3
5	KP84	L4	True	1000.00	1056.39	105.6
6	KP85	L5	True	2500.00	2539.58	101.6
7	KP86	L6	True	10000.00	10418.35	104.2
8	KP87	L7	True	20000.00	19456.66	97.3



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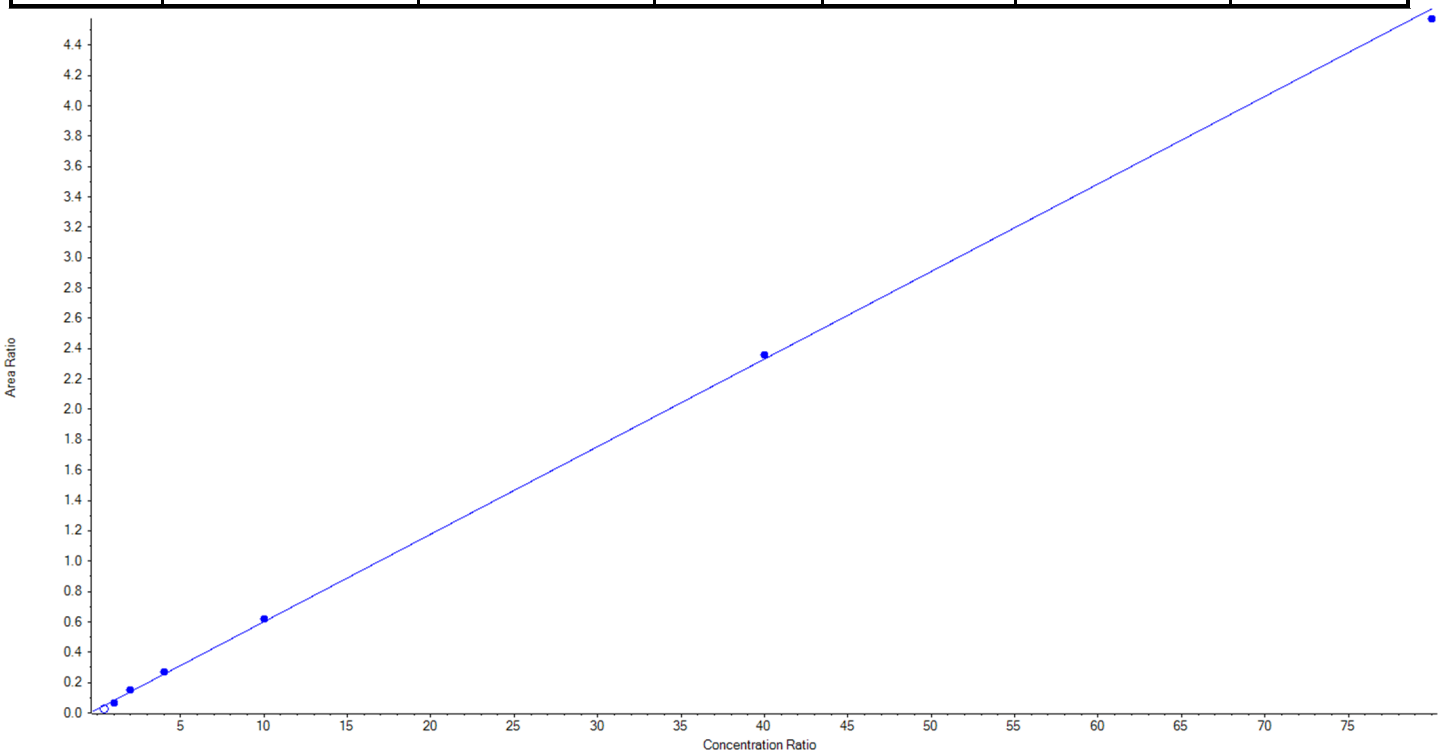
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTrDA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	663.0 / 169.0	**Result Table**	19-0746
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.05768 x + 0.02414 (r = 0.99945) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	False	100.00	1.85	1.9
3	KP82	L2	True	250.00	195.07	78.0
4	KP83	L3	True	500.00	564.07	112.8
5	KP84	L4	True	1000.00	1057.05	105.7
6	KP85	L5	True	2500.00	2589.37	103.6
7	KP86	L6	True	10000.00	10131.27	101.3
8	KP87	L7	True	20000.00	19713.17	98.6



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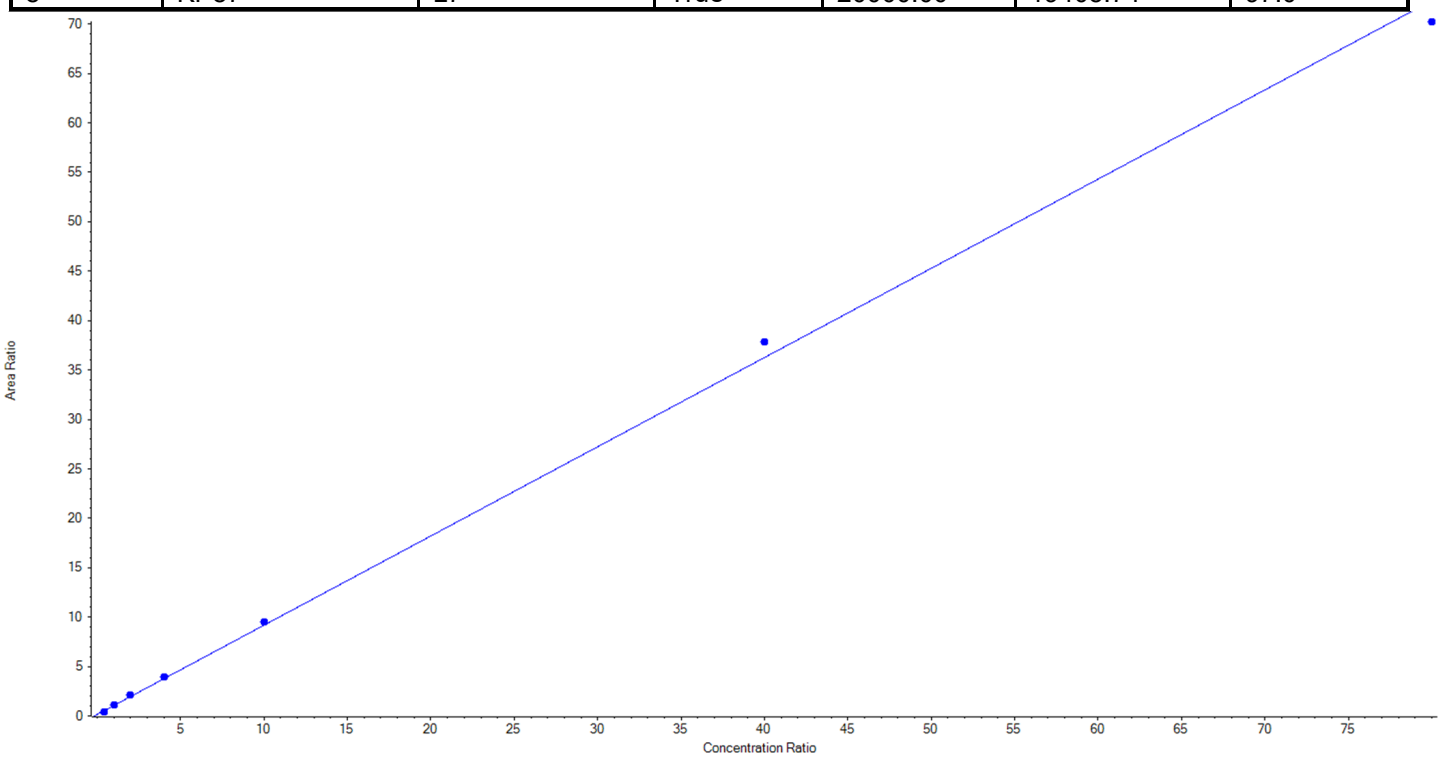
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTeDA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	713.0 / 669.0	**Result Table**	19-0746
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.90266 x + 0.15418 (r = 0.99918) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	76.98	77.0
3	KP82	L2	True	250.00	258.36	103.3
4	KP83	L3	True	500.00	552.03	110.4
5	KP84	L4	True	1000.00	1048.09	104.8
6	KP85	L5	True	2500.00	2578.11	103.1
7	KP86	L6	True	10000.00	10430.69	104.3
8	KP87	L7	True	20000.00	19405.74	97.0



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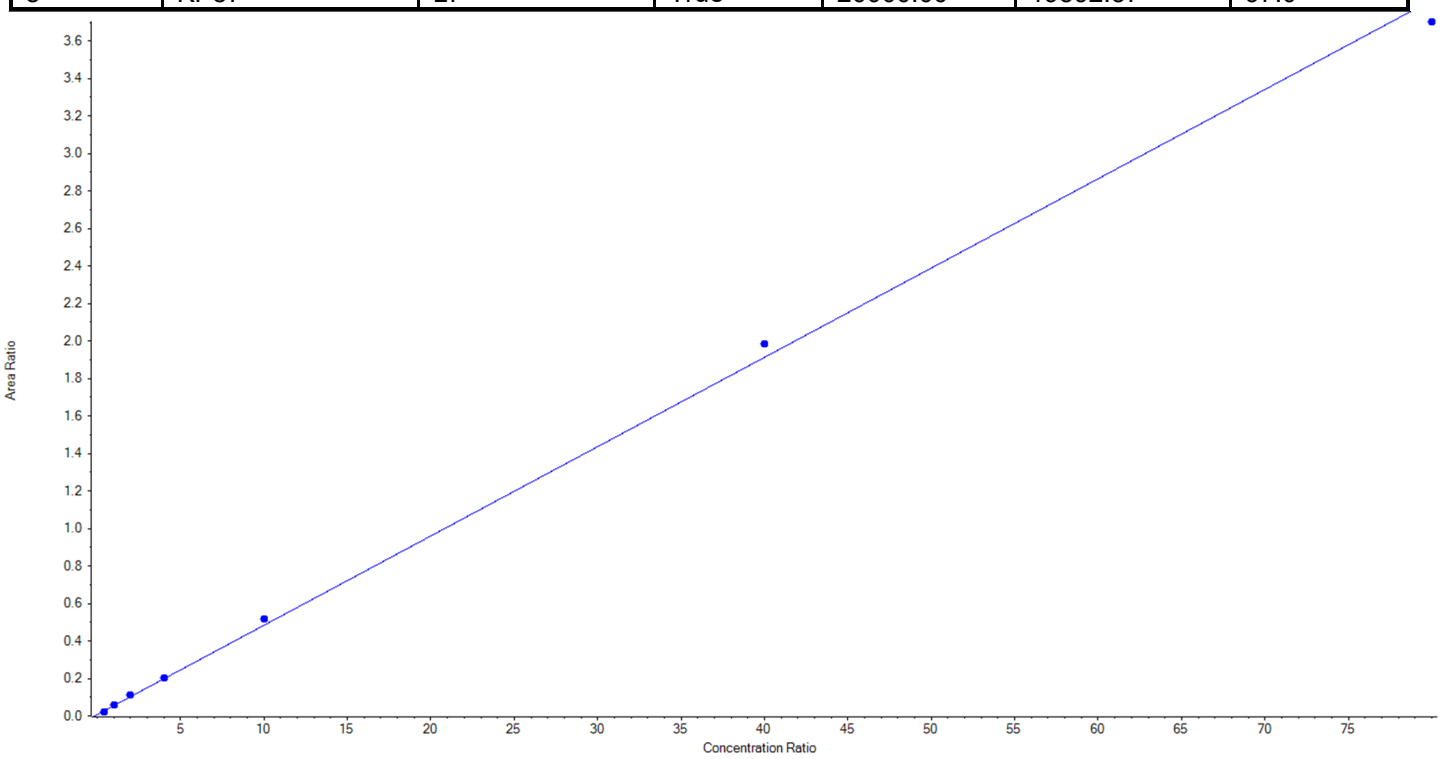
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTeDA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	713.0 / 169.0	**Result Table**	19-0746
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.04764 x + 0.00747 (r = 0.99909) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	76.31	76.3
3	KP82	L2	True	250.00	254.92	102.0
4	KP83	L3	True	500.00	561.15	112.2
5	KP84	L4	True	1000.00	1021.78	102.2
6	KP85	L5	True	2500.00	2664.13	106.6
7	KP86	L6	True	10000.00	10379.35	103.8
8	KP87	L7	True	20000.00	19392.37	97.0



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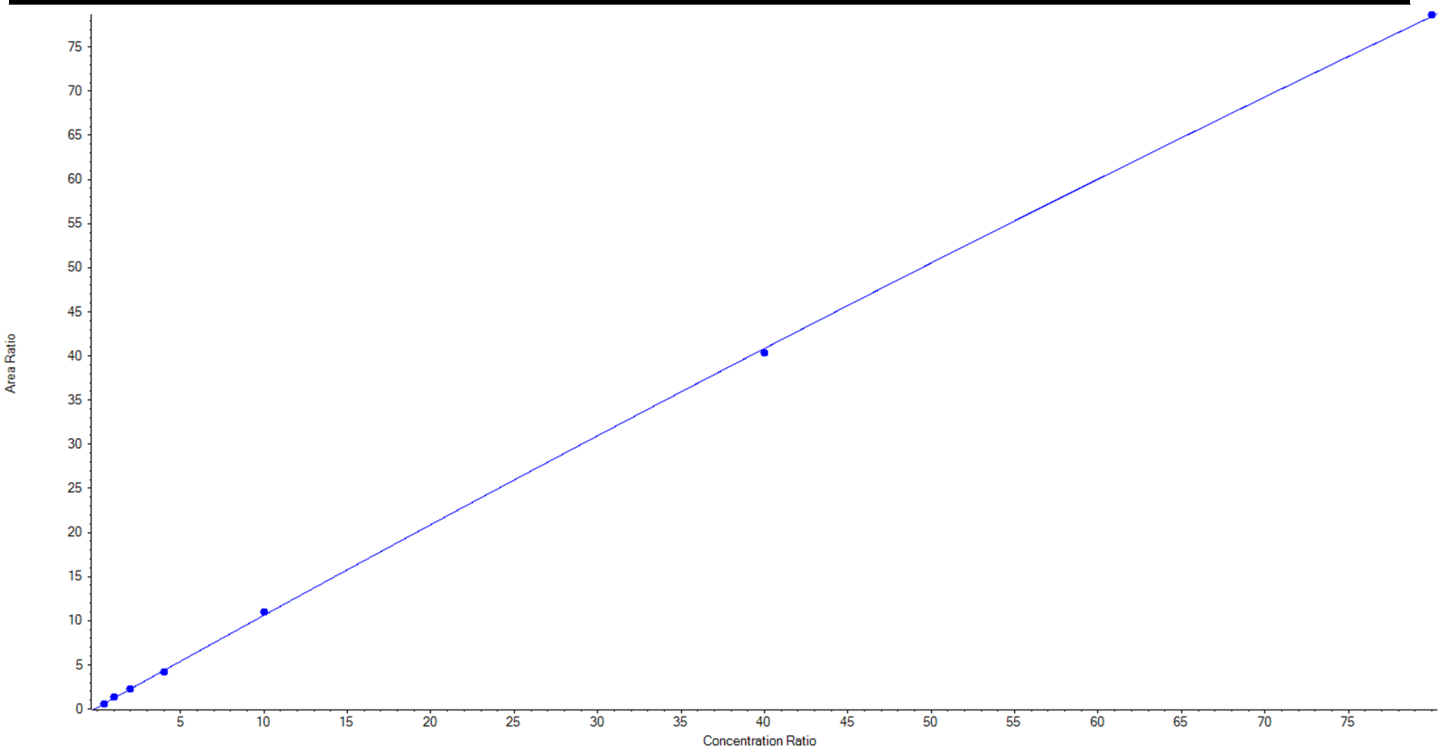
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NMeFOSAA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	570.0 / 419.0	**Result Table**	19-0746
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -9.61362e-4 x^2 + 1.05584 x + 0.14950 (r = 0.99981) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	92.35	92.4
3	KP82	L2	True	250.00	275.76	110.3
4	KP83	L3	True	500.00	494.65	98.9
5	KP84	L4	True	1000.00	953.29	95.3
6	KP85	L5	True	2500.00	2600.32	104.0
7	KP86	L6	True	10000.00	9882.13	98.8
8	KP87	L7	True	20000.00	20052.14	100.3



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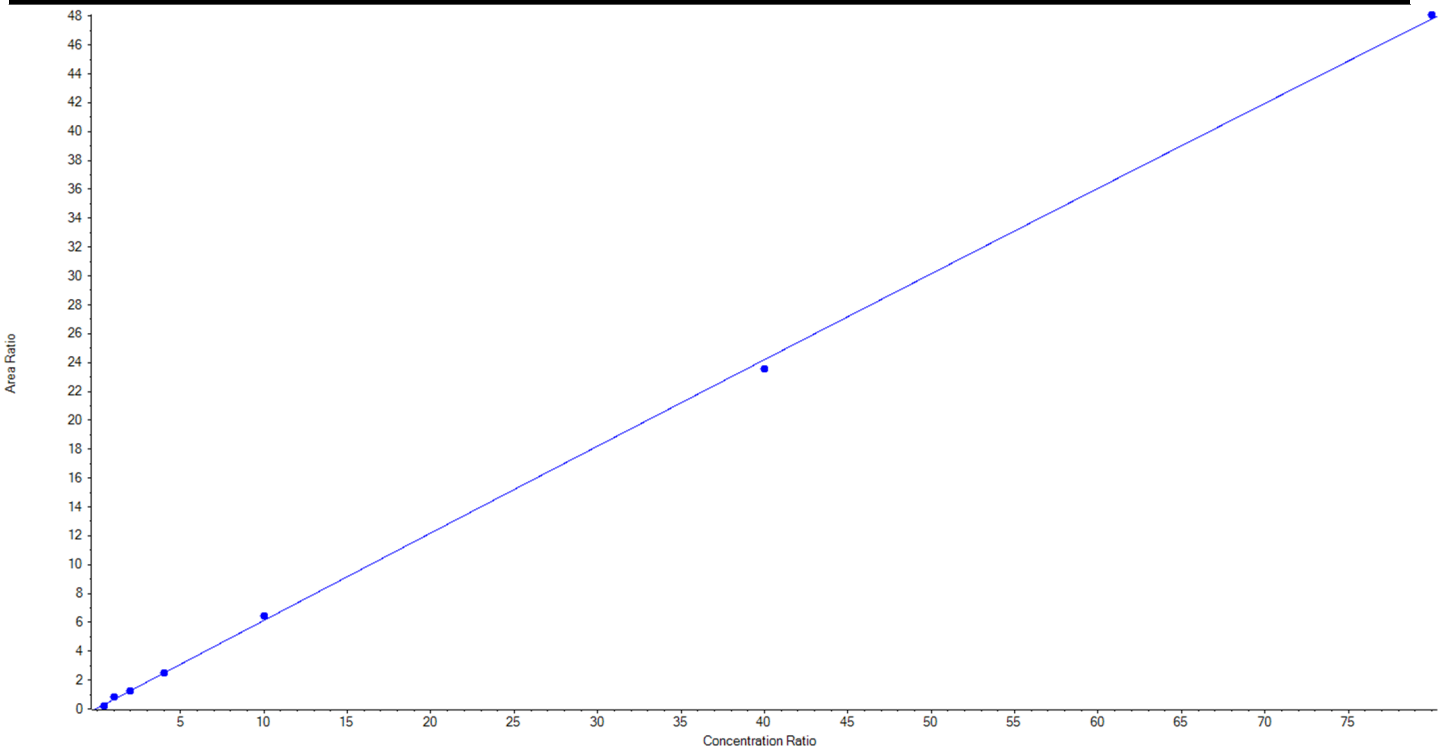
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NMeFOSAA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	570.0 / 512.0	**Result Table**	19-0746
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -1.68272e-4 x^2 + 0.61055 x + 0.04475 (r = 0.99945) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	77.09	77.1
3	KP82	L2	True	250.00	309.15	123.7
4	KP83	L3	True	500.00	479.31	95.9
5	KP84	L4	True	1000.00	1003.63	100.4
6	KP85	L5	True	2500.00	2626.90	105.1
7	KP86	L6	True	10000.00	9735.67	97.4
8	KP87	L7	True	20000.00	20118.47	100.6



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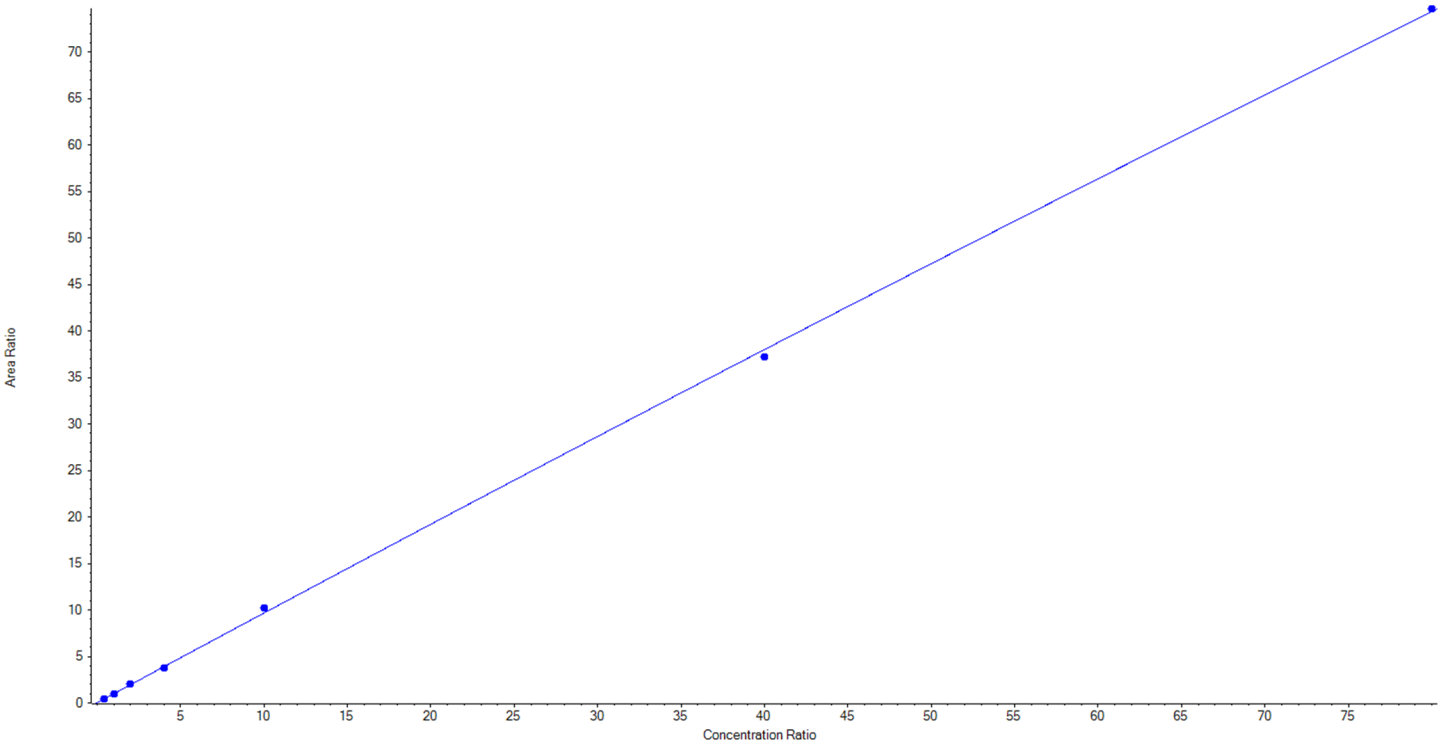
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NEtFOSAA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	584.0 / 419.0	**Result Table**	19-0746
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -5.15110e-4 x^2 + 0.97042 x + 0.02043 (r = 0.99977) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	99.02	99.0
3	KP82	L2	True	250.00	239.28	95.7
4	KP83	L3	True	500.00	524.41	104.9
5	KP84	L4	True	1000.00	966.38	96.6
6	KP85	L5	True	2500.00	2632.24	105.3
7	KP86	L6	True	10000.00	9801.97	98.0
8	KP87	L7	True	20000.00	20087.12	100.4



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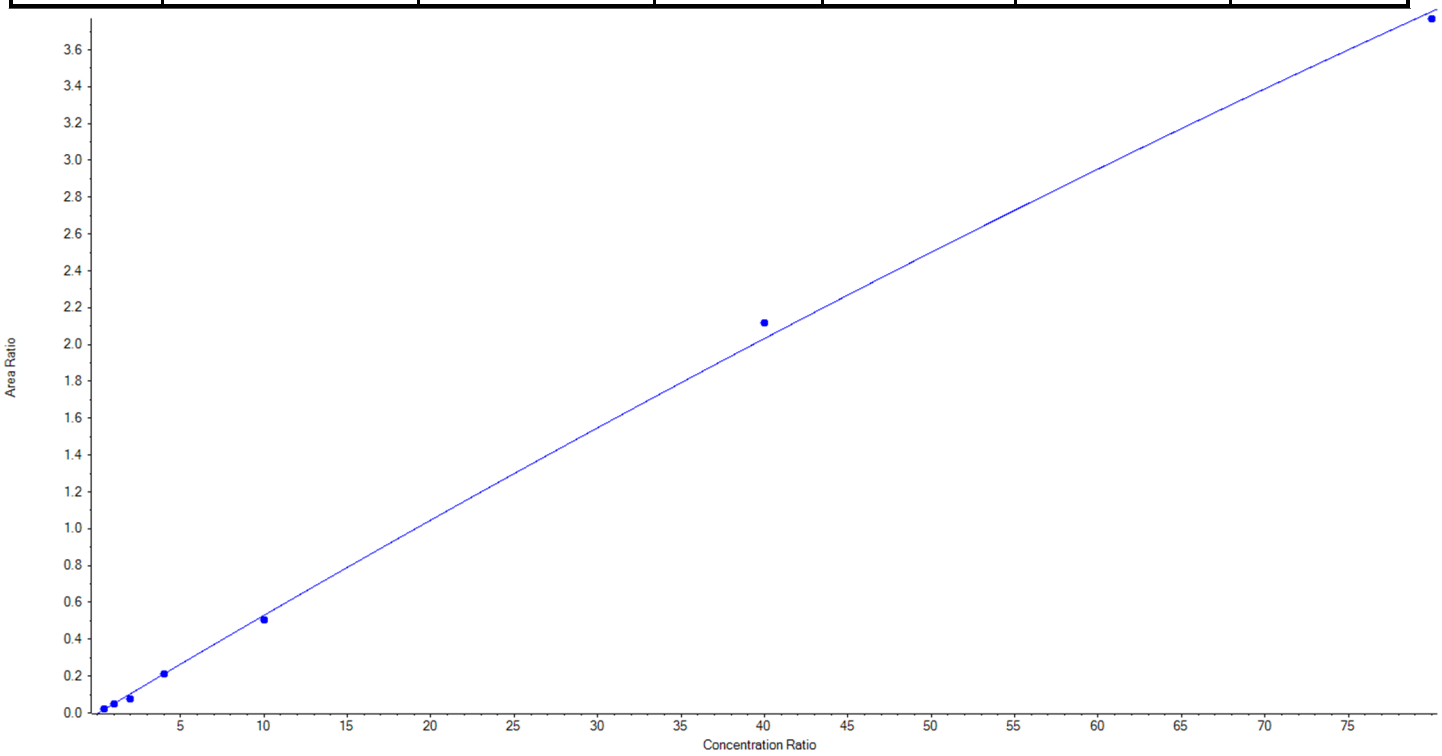
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NEtFOSAA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	584.0 / 483.0	**Result Table**	19-0746
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -8.17683e-5 x^2 + 0.05419 x + -0.00399 (r = 0.99880) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	127.95	128.0
3	KP82	L2	True	250.00	248.31	99.3
4	KP83	L3	True	500.00	371.99	74.4
5	KP84	L4	True	1000.00	995.85	99.6
6	KP85	L5	True	2500.00	2386.07	95.4
7	KP86	L6	True	10000.00	10453.35	104.5
8	KP87	L7	True	20000.00	19761.05	98.8



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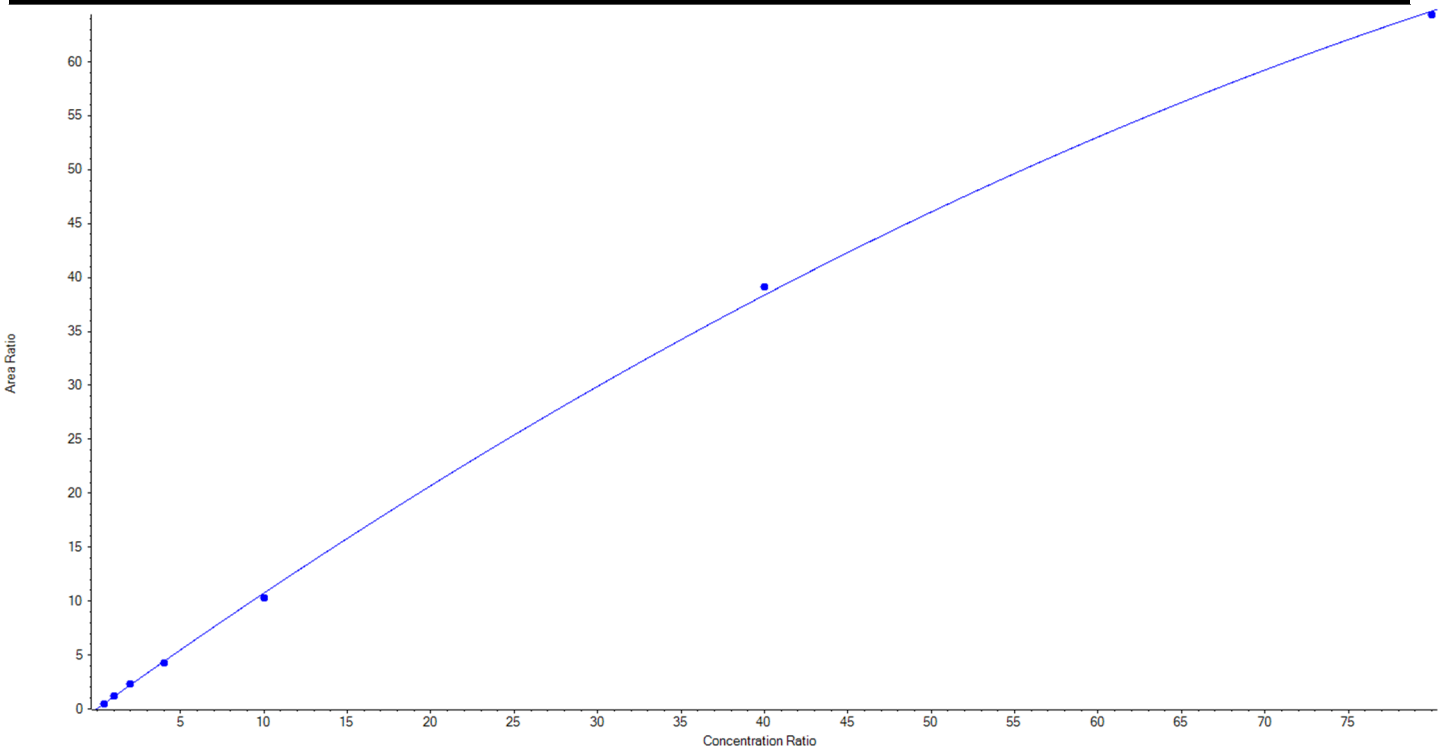
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	HFPO-DA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	285.0 / 169.0	**Result Table**	19-0746
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -0.00375 x^2 + 1.10857 x + 0.02924 (r = 0.99966) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	92.06	92.1
3	KP82	L2	True	250.00	275.97	110.4
4	KP83	L3	True	500.00	520.08	104.0
5	KP84	L4	True	1000.00	964.38	96.4
6	KP85	L5	True	2500.00	2384.40	95.4
7	KP86	L6	True	10000.00	10249.45	102.5
8	KP87	L7	True	20000.00	19834.77	99.2



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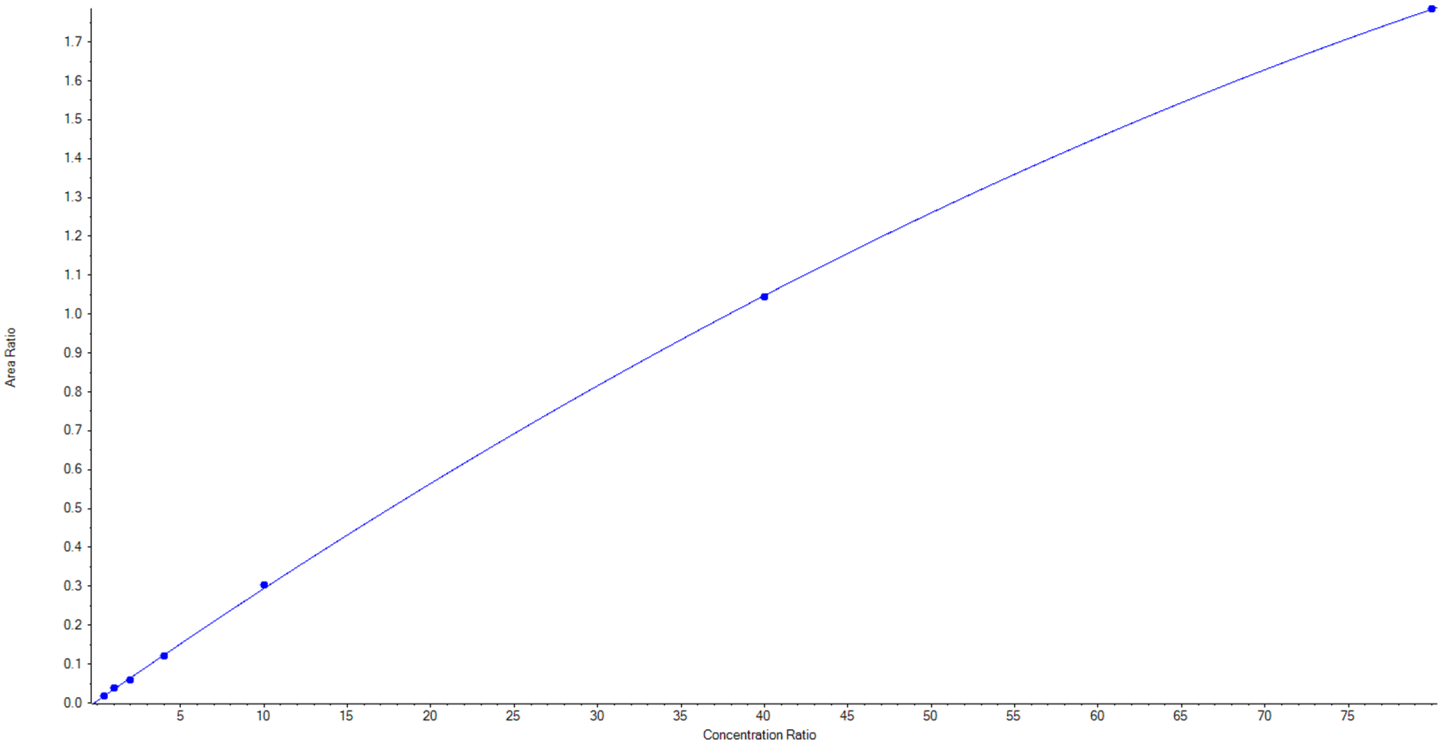
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	HFPO-DA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	285.0 / 118.8	**Result Table**	19-0746
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -9.58458e-5 x^2 + 0.02990 x + 0.00494 (r = 0.99972) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	98.97	99.0
3	KP82	L2	True	250.00	278.29	111.3
4	KP83	L3	True	500.00	446.45	89.3
5	KP84	L4	True	1000.00	976.84	97.7
6	KP85	L5	True	2500.00	2578.34	103.1
7	KP86	L6	True	10000.00	9952.18	99.5
8	KP87	L7	True	20000.00	20022.07	100.1



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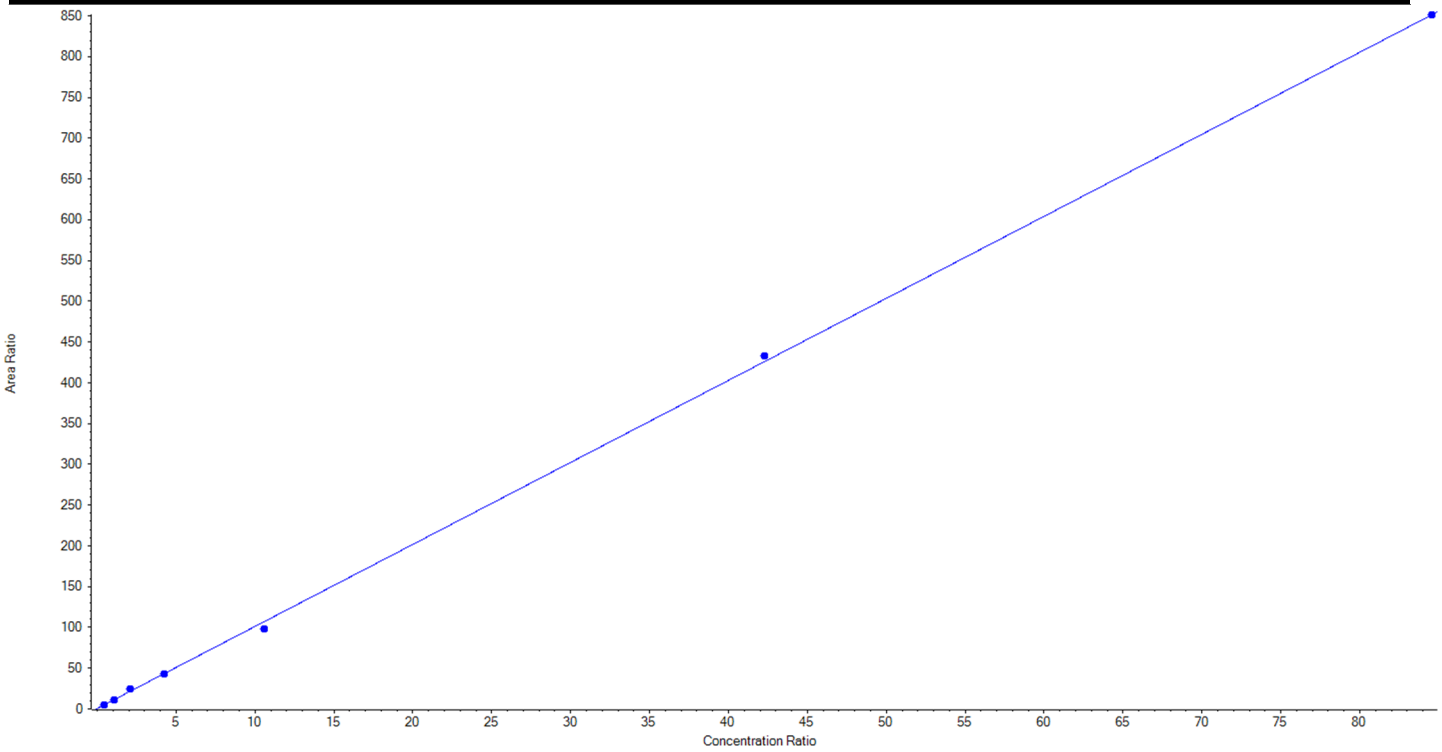
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	ADONA_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	377.0 / 251.0	**Result Table**	19-0746
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 10.05970 x + 0.59891 (r = 0.99951) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	100.00	92.16	92.2
3	KP82	L2	True	250.00	257.41	103.0
4	KP83	L3	True	500.00	566.98	113.4
5	KP84	L4	True	1000.00	983.26	98.3
6	KP85	L5	True	2500.00	2288.17	91.5
7	KP86	L6	True	10000.00	10162.23	101.6
8	KP87	L7	True	20000.00	19999.78	100.0



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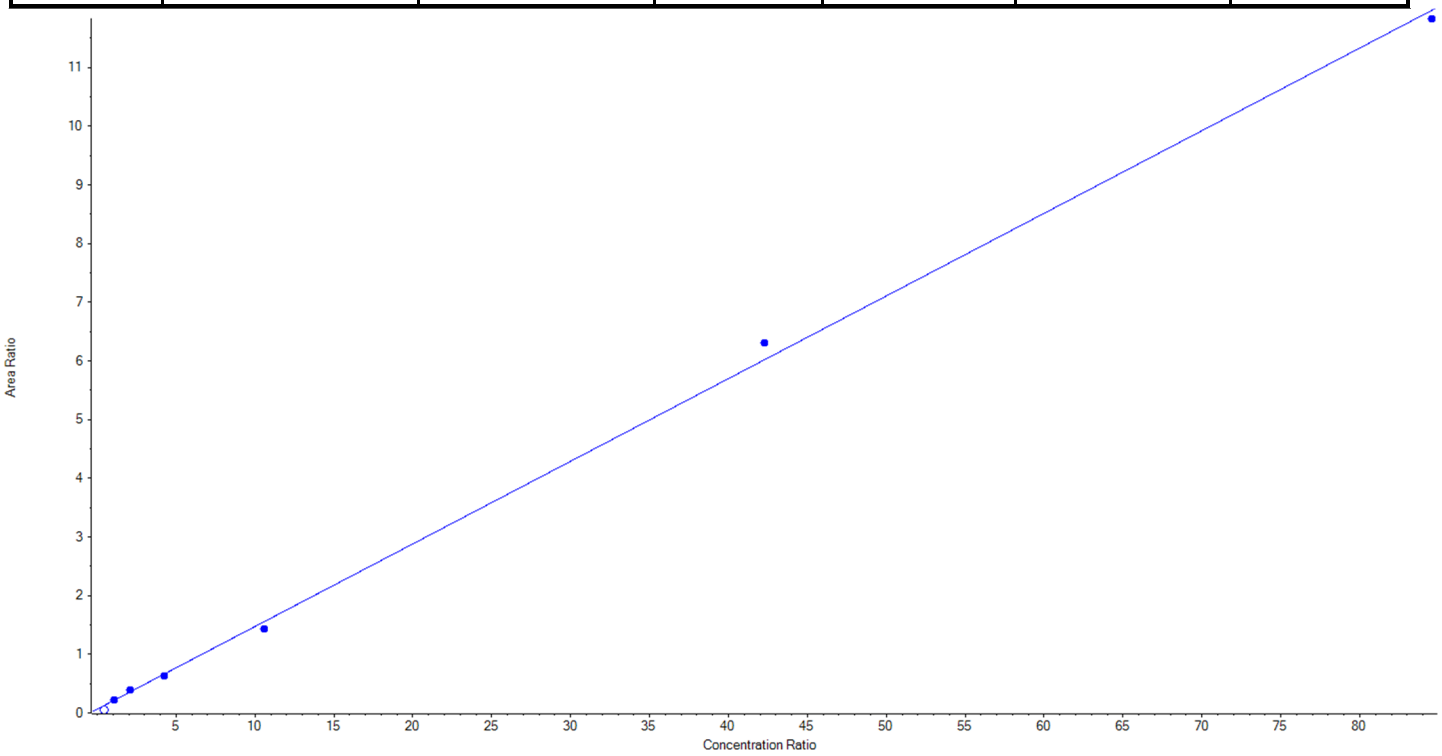
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	ADONA_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	377.0 / 85.0	**Result Table**	19-0746
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.14083 x + 0.06455 (r = 0.99916) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	False	100.00	< 0	N/A
3	KP82	L2	True	250.00	257.88	103.2
4	KP83	L3	True	500.00	536.78	107.4
5	KP84	L4	True	1000.00	946.95	94.7
6	KP85	L5	True	2500.00	2283.11	91.3
7	KP86	L6	True	10000.00	10469.23	104.7
8	KP87	L7	True	20000.00	19756.05	98.8



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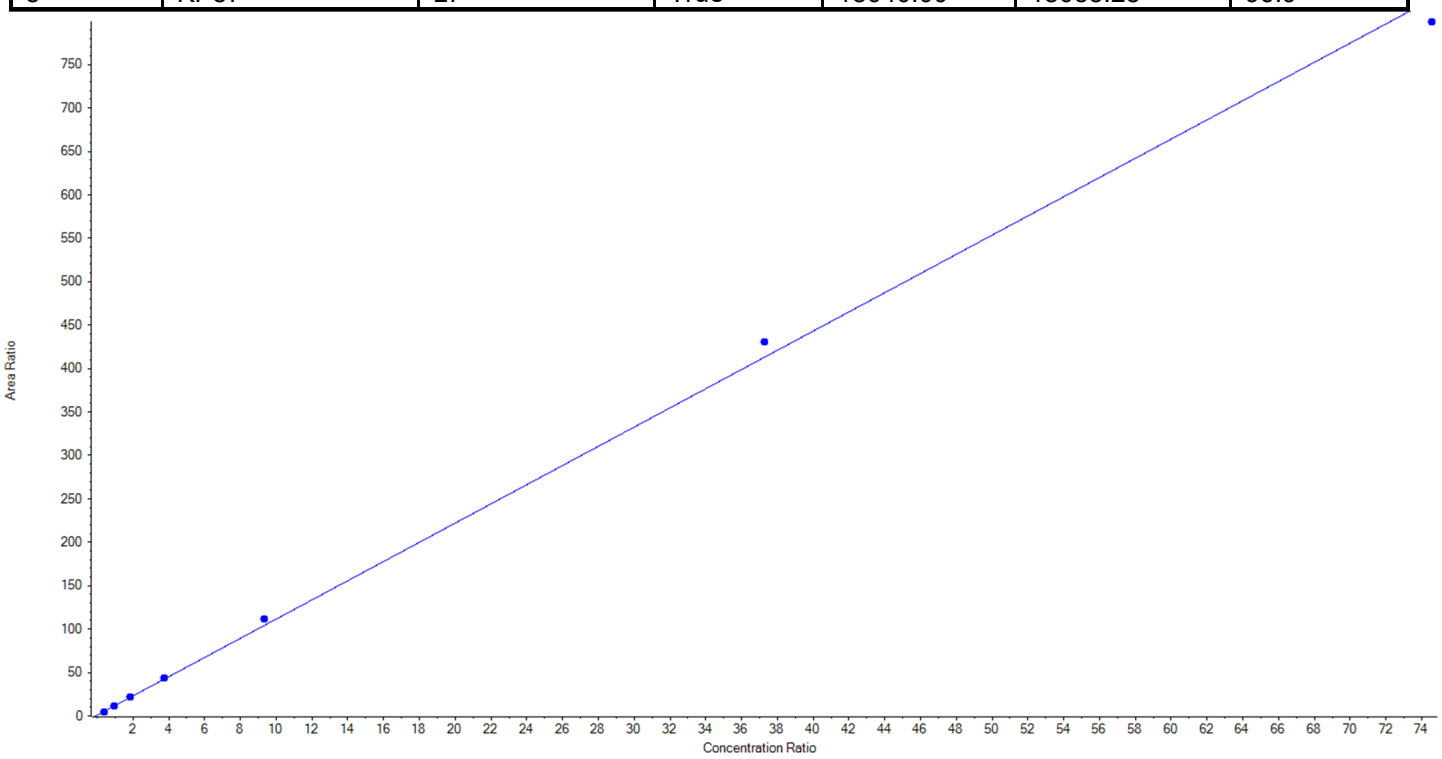
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	9Cl-PF3ONS_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	531.0 / 351.0	**Result Table**	19-0746
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 11.05317 x + 0.95414 (r = 0.99916) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	93.20	83.02	89.1
3	KP82	L2	True	233.00	228.66	98.1
4	KP83	L3	True	466.00	472.99	101.5
5	KP84	L4	True	932.00	961.14	103.1
6	KP85	L5	True	2330.00	2492.75	107.0
7	KP86	L6	True	9320.00	9722.35	104.3
8	KP87	L7	True	18640.00	18053.28	96.9



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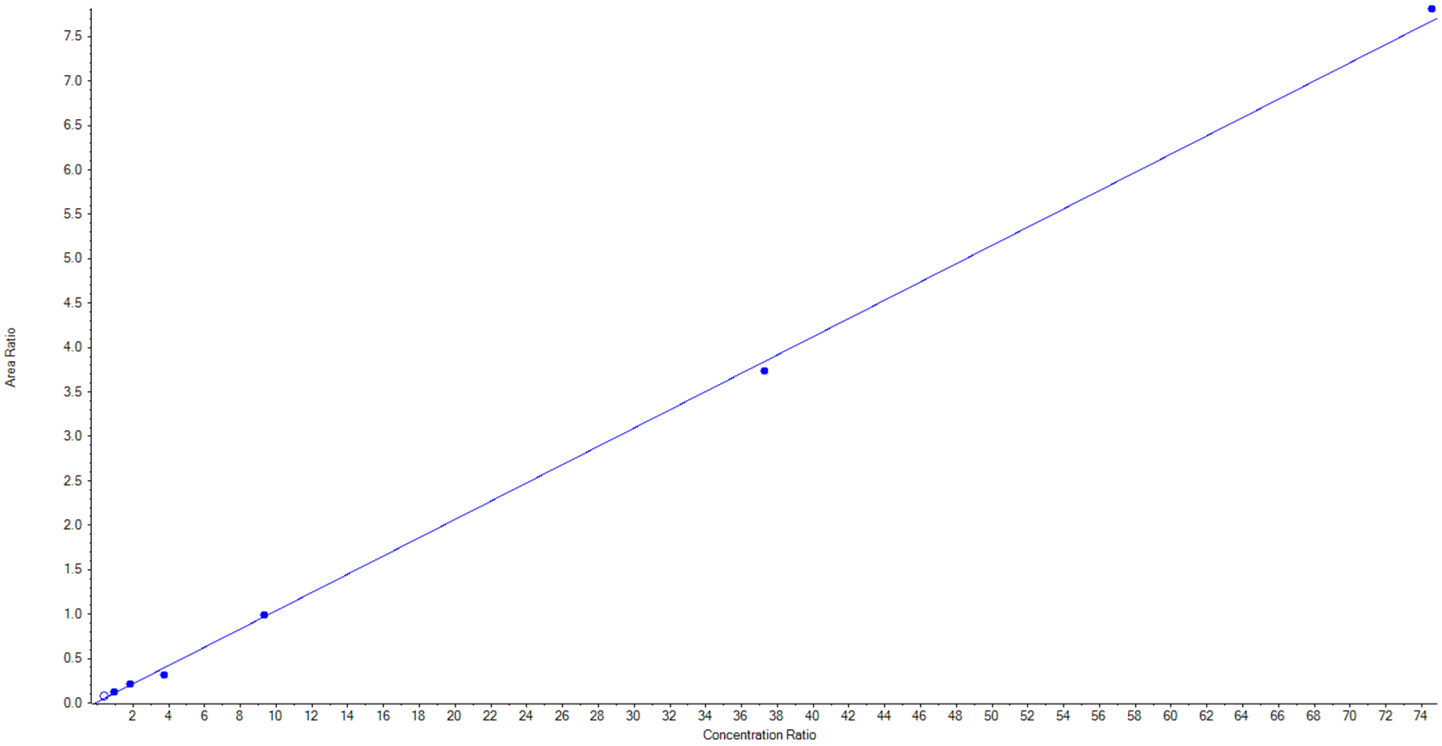
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	9Cl-PF3ONS_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	531.0 / 83.0	**Result Table**	19-0746
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.10280 x + 0.01020 (r = 0.99898) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	False	93.20	178.82	191.9
3	KP82	L2	True	233.00	263.07	112.9
4	KP83	L3	True	466.00	491.19	105.4
5	KP84	L4	True	932.00	748.30	80.3
6	KP85	L5	True	2330.00	2386.15	102.4
7	KP86	L6	True	9320.00	9059.66	97.2
8	KP87	L7	True	18640.00	18972.63	101.8



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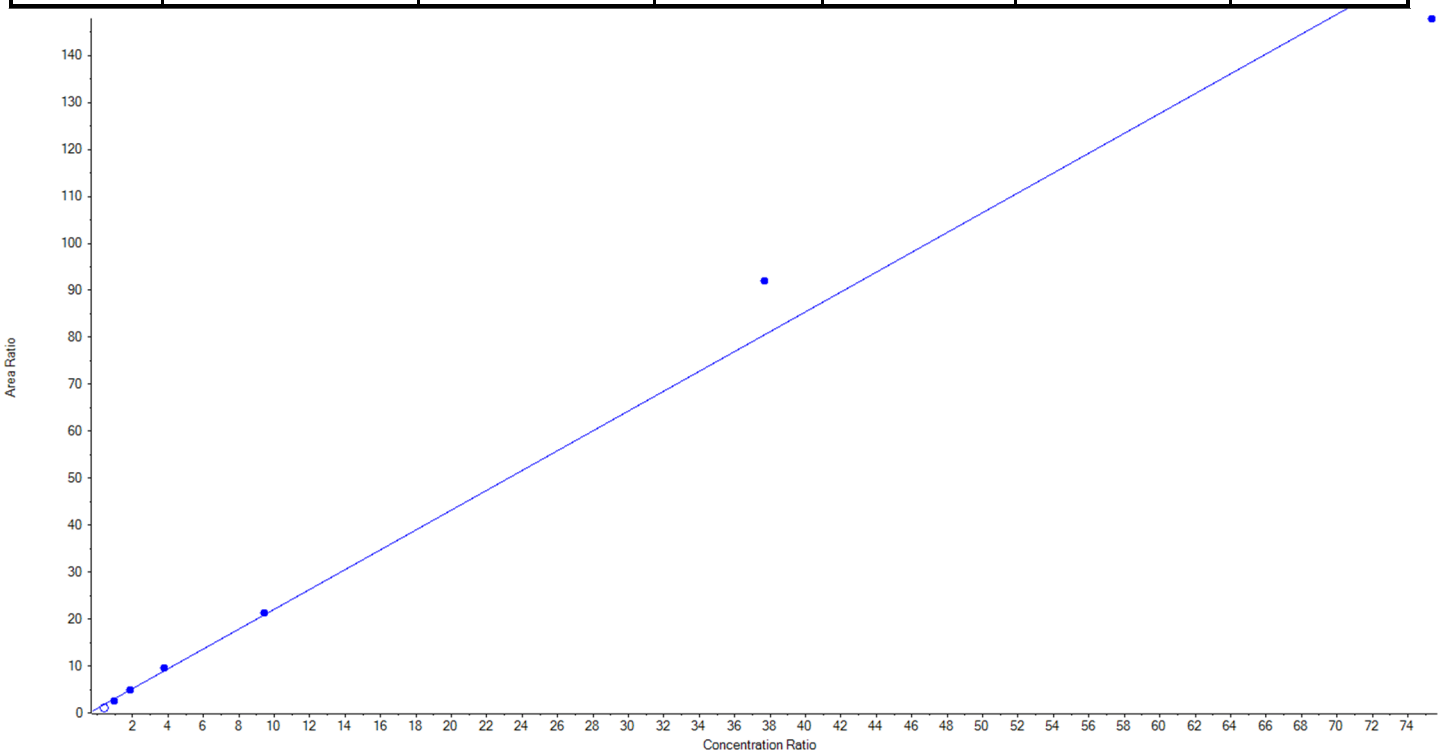
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	11Cl-pf3OUdS_1	**Data File**	AC_09012019_5-369.wiff
MRM Transition	631.0 / 451.0	**Result Table**	19-0746
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 2.11194 x + 0.95634 (r = 0.99424) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	False	94.20	3.96	4.2
3	KP82	L2	True	235.50	196.31	83.4
4	KP83	L3	True	471.00	462.43	98.2
5	KP84	L4	True	942.00	1028.51	109.2
6	KP85	L5	True	2355.00	2416.99	102.6
7	KP86	L6	True	9420.00	10773.03	114.4
8	KP87	L7	True	18840.00	17386.24	92.3



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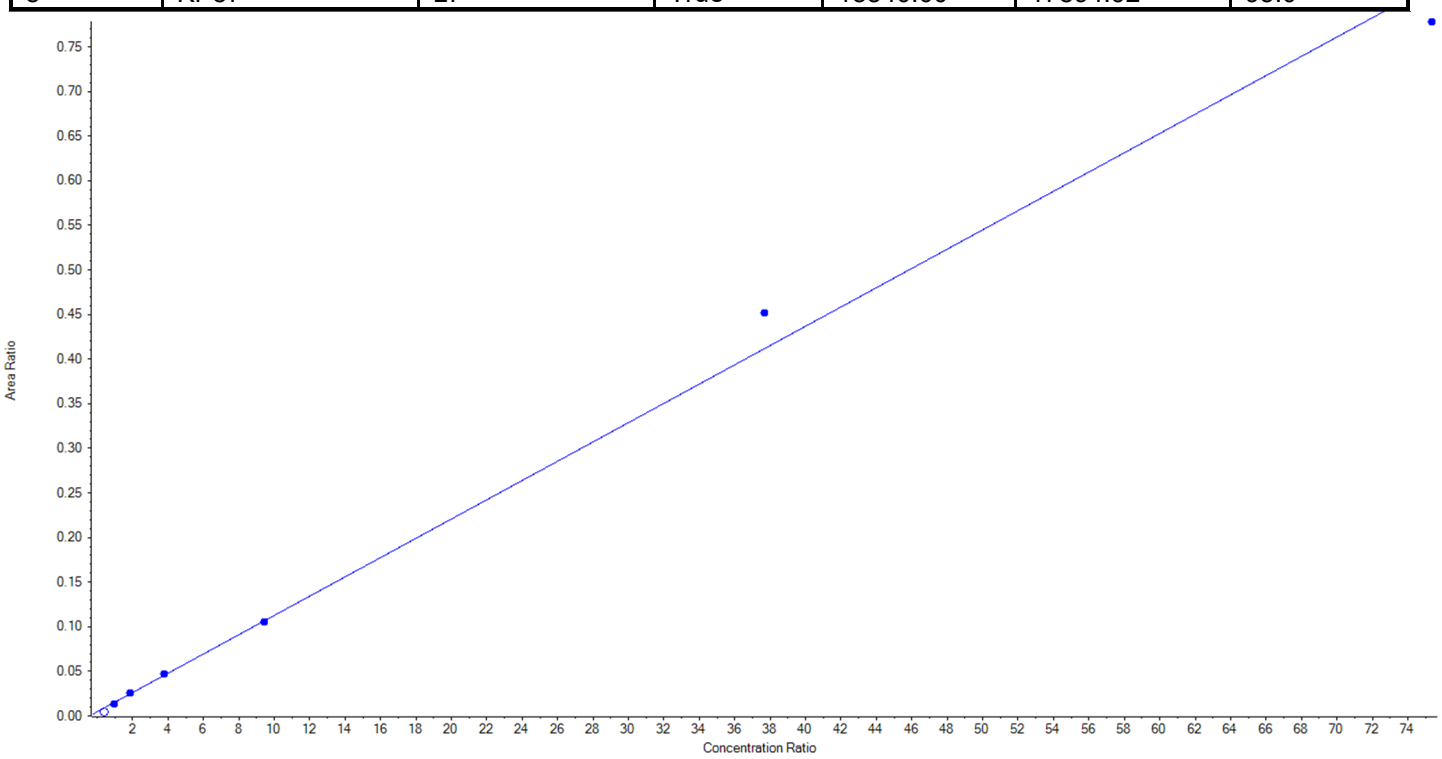
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	11Cl-pf3OUdS_2	**Data File**	AC_09012019_5-369.wiff
MRM Transition	631.0 / 83.0	**Result Table**	19-0746
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.01080 x + 0.00462 (r = 0.99741) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	False	94.20	< 0	N/A
3	KP82	L2	True	235.50	209.76	89.1
4	KP83	L3	True	471.00	479.29	101.8
5	KP84	L4	True	942.00	987.92	104.9
6	KP85	L5	True	2355.00	2341.80	99.4
7	KP86	L6	True	9420.00	10349.81	109.9
8	KP87	L7	True	18840.00	17894.92	95.0



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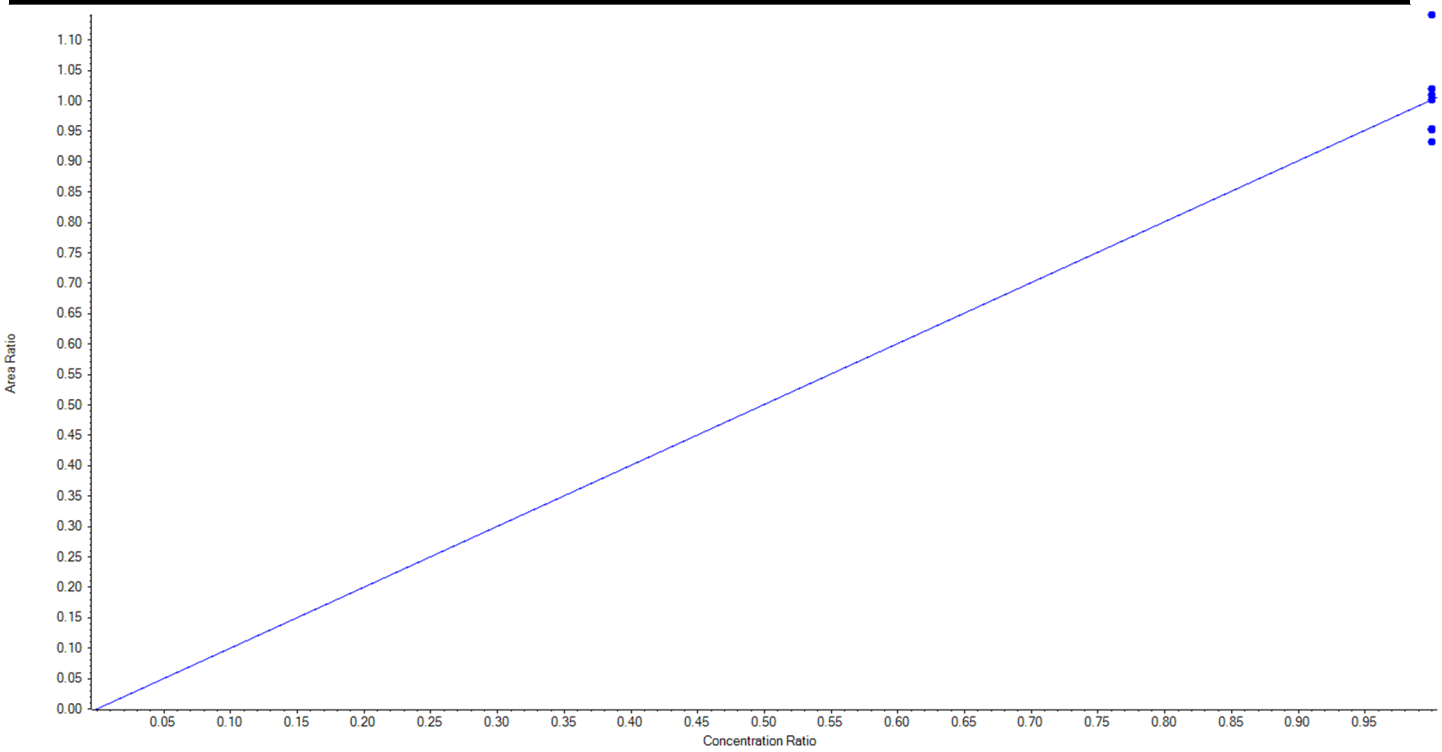
Calibration Summary Report

Analyte Name	13C2-PFDoA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	615.0 / 570.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.00158 x (std. dev. = 0.07015) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	237.57	95.0
3	KP82	L2	True	250.00	232.73	93.1
4	KP83	L3	True	250.00	252.14	100.9
5	KP84	L4	True	250.00	237.96	95.2
6	KP85	L5	True	250.00	250.16	100.1
7	KP86	L6	True	250.00	254.57	101.8
8	KP87	L7	True	250.00	284.88	114.0



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Calibration Summary Report

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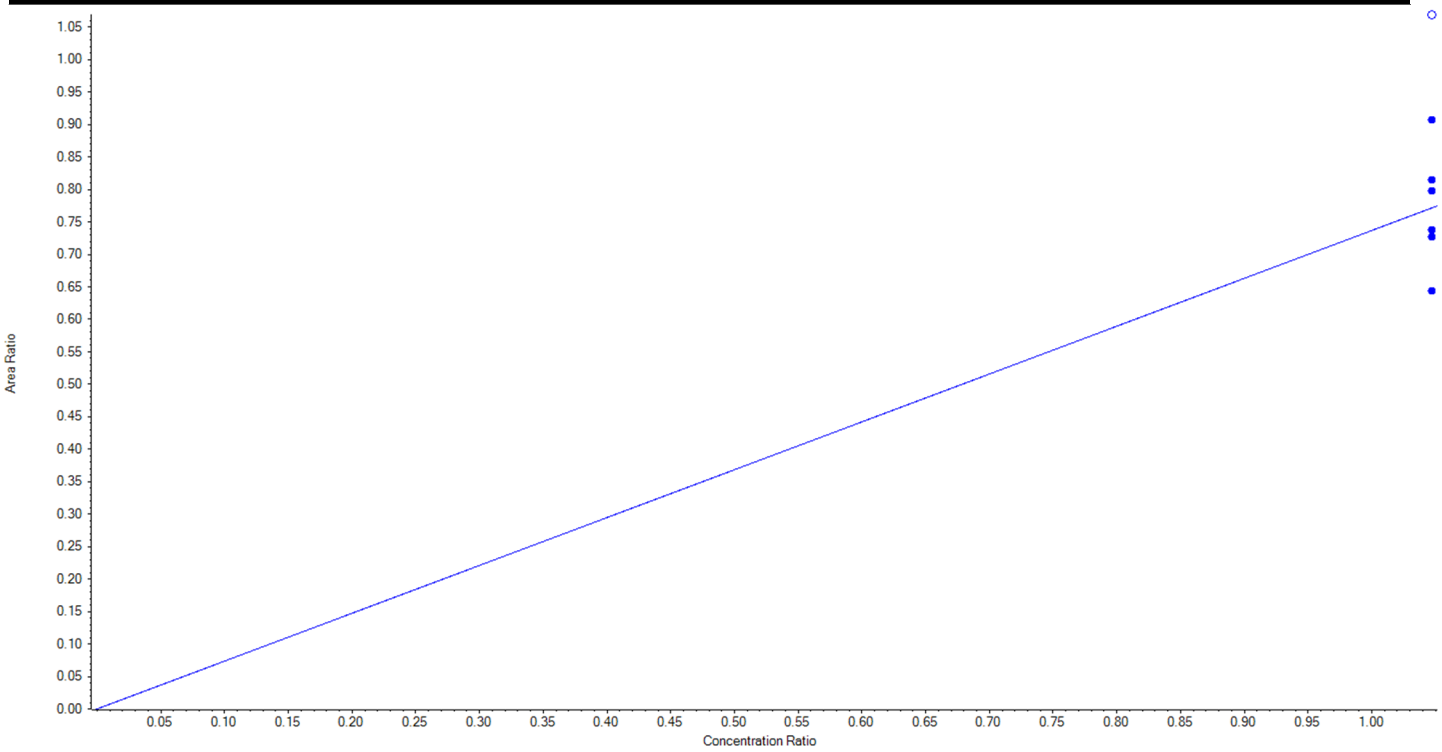
Printed: 04/09/2019 12:30:55 PM

Analyte Name	d3-MeFOSAA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	573.0 / 419.0	**Result Table**	19-0746_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.73681 x (std. dev. = 0.08579) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	264.13	105.7
3	KP82	L2	True	250.00	208.77	83.5
4	KP83	L3	True	250.00	258.65	103.5
5	KP84	L4	True	250.00	235.39	94.2
6	KP85	L5	True	250.00	239.13	95.7
7	KP86	L6	True	250.00	293.94	117.6
8	KP87	L7	False	250.00	346.37	138.6



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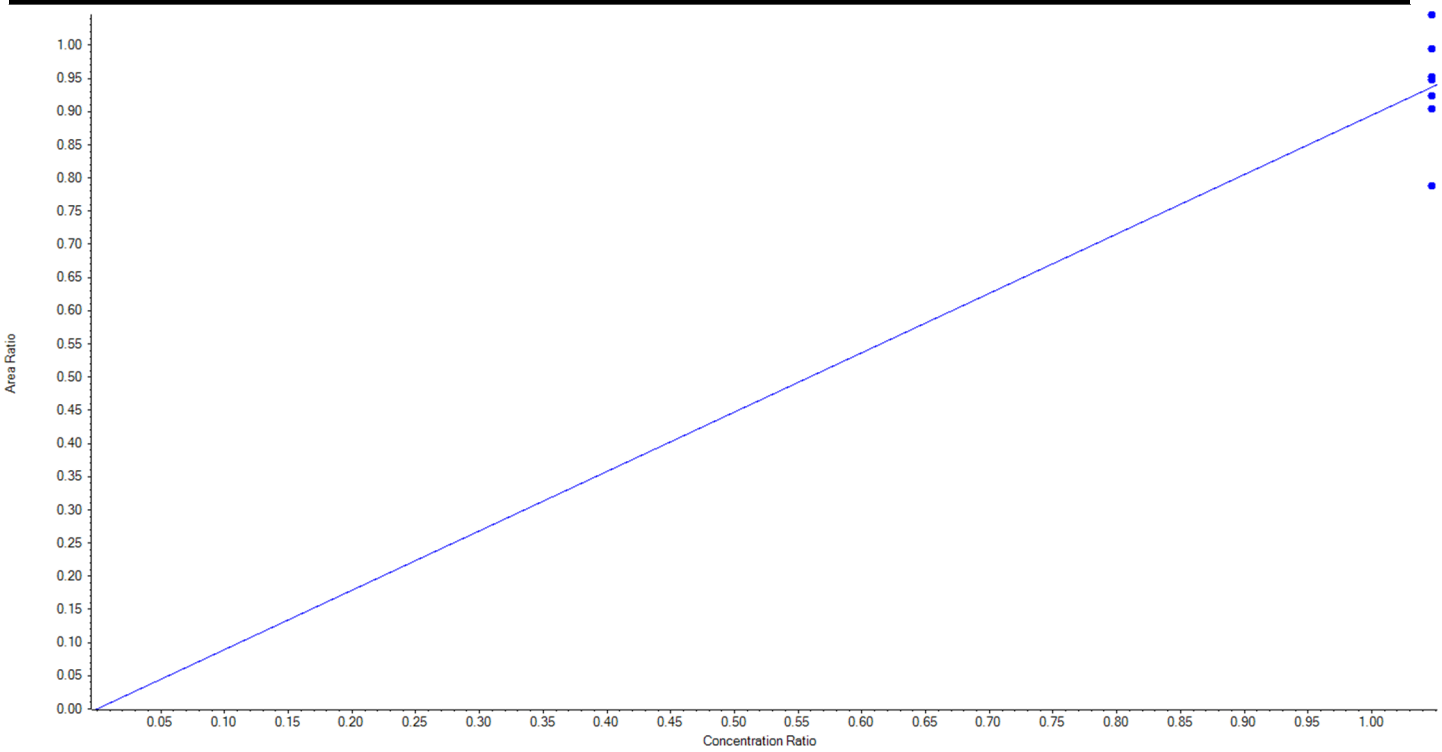
Calibration Summary Report

Analyte Name	d5-EtFOSAA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	589.0 / 419.0	**Result Table**	19-0746_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.89456 x (std. dev. = 0.07675) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	265.25	106.1
3	KP82	L2	True	250.00	241.45	96.6
4	KP83	L3	True	250.00	254.36	101.8
5	KP84	L4	True	250.00	246.35	98.5
6	KP85	L5	True	250.00	210.42	84.2
7	KP86	L6	True	250.00	253.07	101.2
8	KP87	L7	True	250.00	279.10	111.6



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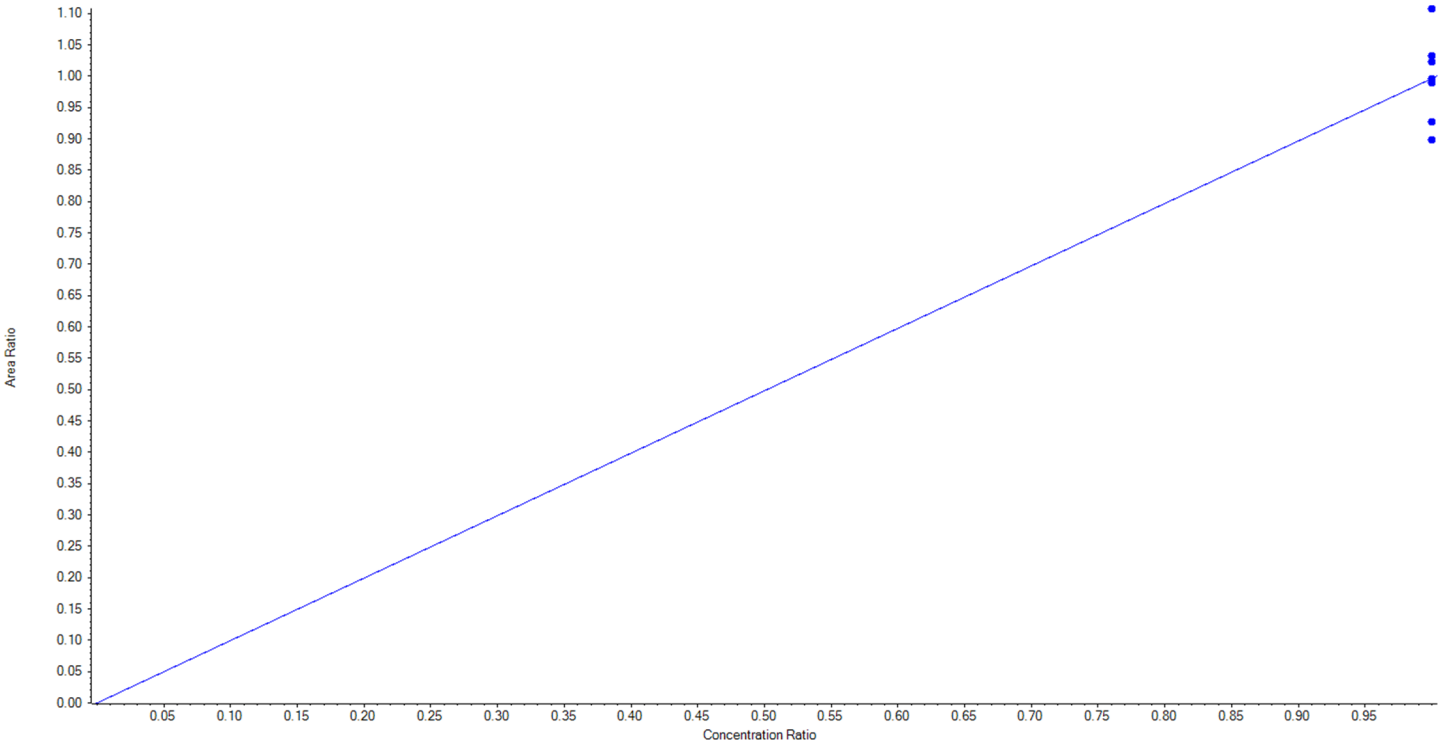
Calibration Summary Report

Analyte Name	13C5-PFHxA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	318.0 / 273.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.99649 x (std. dev. = 0.06936) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	248.24	99.3
3	KP82	L2	True	250.00	256.60	102.6
4	KP83	L3	True	250.00	249.94	100.0
5	KP84	L4	True	250.00	225.38	90.2
6	KP85	L5	True	250.00	277.91	111.2
7	KP86	L6	True	250.00	232.70	93.1
8	KP87	L7	True	250.00	259.24	103.7



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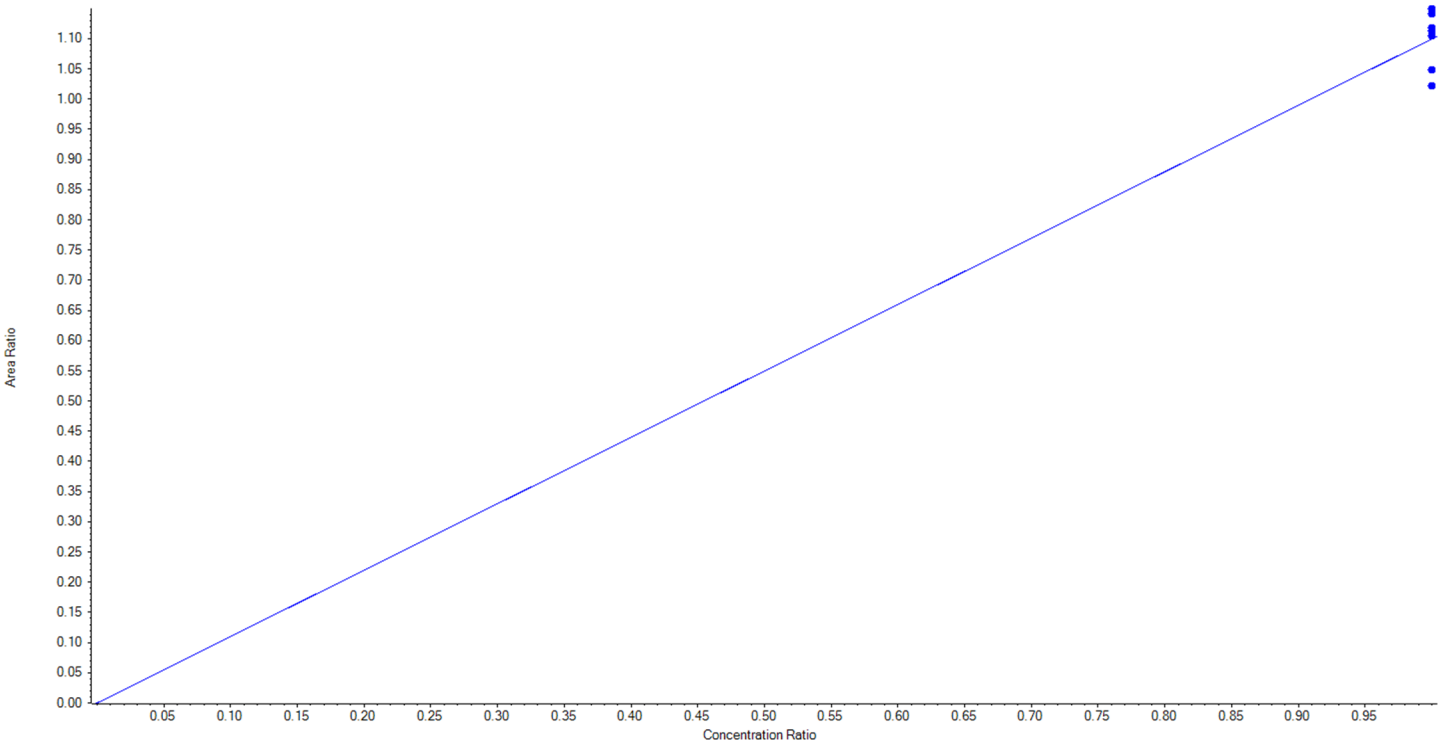
Calibration Summary Report

Analyte Name	13C4-PFHpA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	367.0 / 322.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.09962 x (std. dev. = 0.04757) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	253.06	101.2
3	KP82	L2	True	250.00	254.35	101.7
4	KP83	L3	True	250.00	259.60	103.8
5	KP84	L4	True	250.00	238.32	95.3
6	KP85	L5	True	250.00	251.09	100.4
7	KP86	L6	True	250.00	232.24	92.9
8	KP87	L7	True	250.00	261.33	104.5



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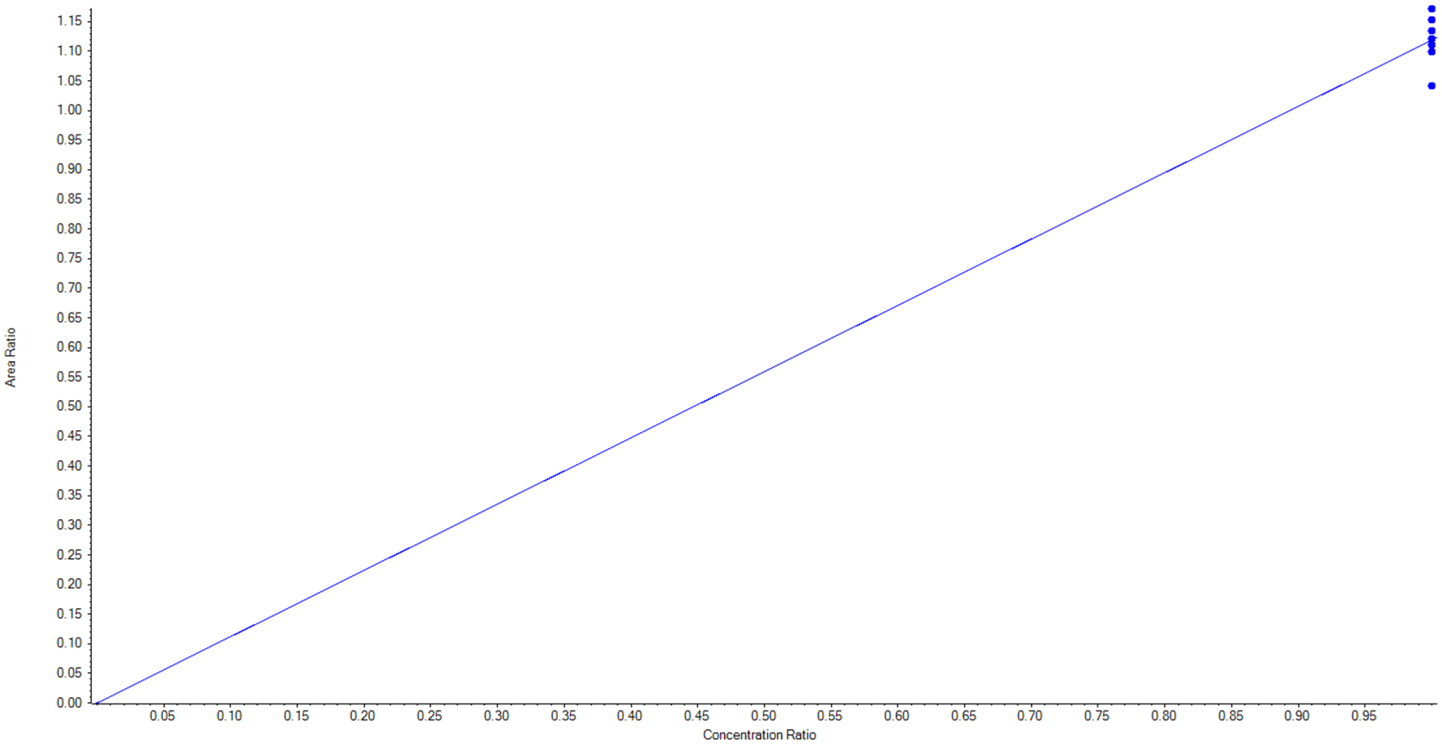
Calibration Summary Report

Analyte Name	13C8-PFOA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	421.0 / 376.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.11868 x (std. dev. = 0.04226) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	253.63	101.5
3	KP82	L2	True	250.00	250.32	100.1
4	KP83	L3	True	250.00	261.80	104.7
5	KP84	L4	True	250.00	232.67	93.1
6	KP85	L5	True	250.00	257.72	103.1
7	KP86	L6	True	250.00	245.58	98.2
8	KP87	L7	True	250.00	248.28	99.3



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Calibration Summary Report

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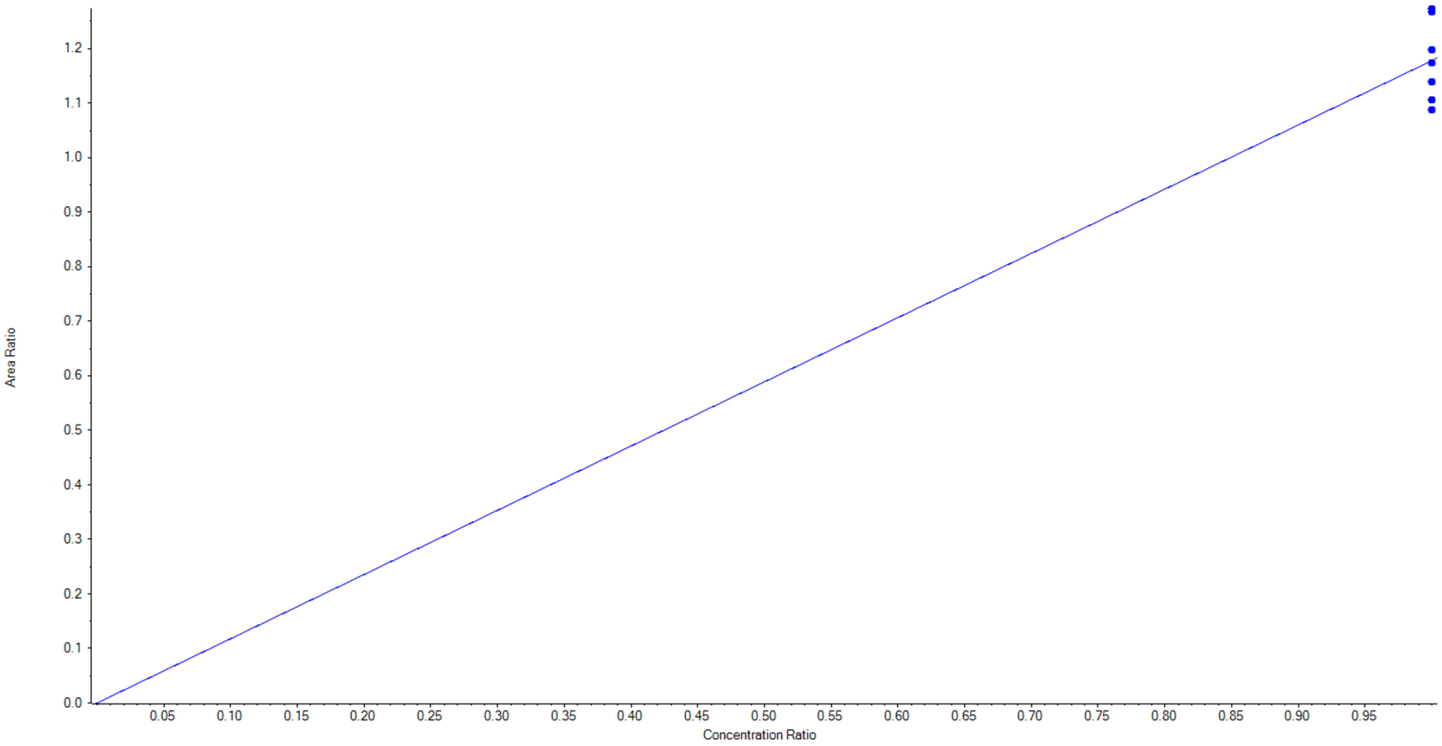
Analyte Name	13C9-PFNA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	472.0 / 427.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.17779 x (std. dev. = 0.07319) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	254.35	101.7
3	KP82	L2	True	250.00	249.19	99.7
4	KP83	L3	True	250.00	268.87	107.6
5	KP84	L4	True	250.00	241.69	96.7
6	KP85	L5	True	250.00	270.18	108.1
7	KP86	L6	True	250.00	230.80	92.3
8	KP87	L7	True	250.00	234.92	94.0



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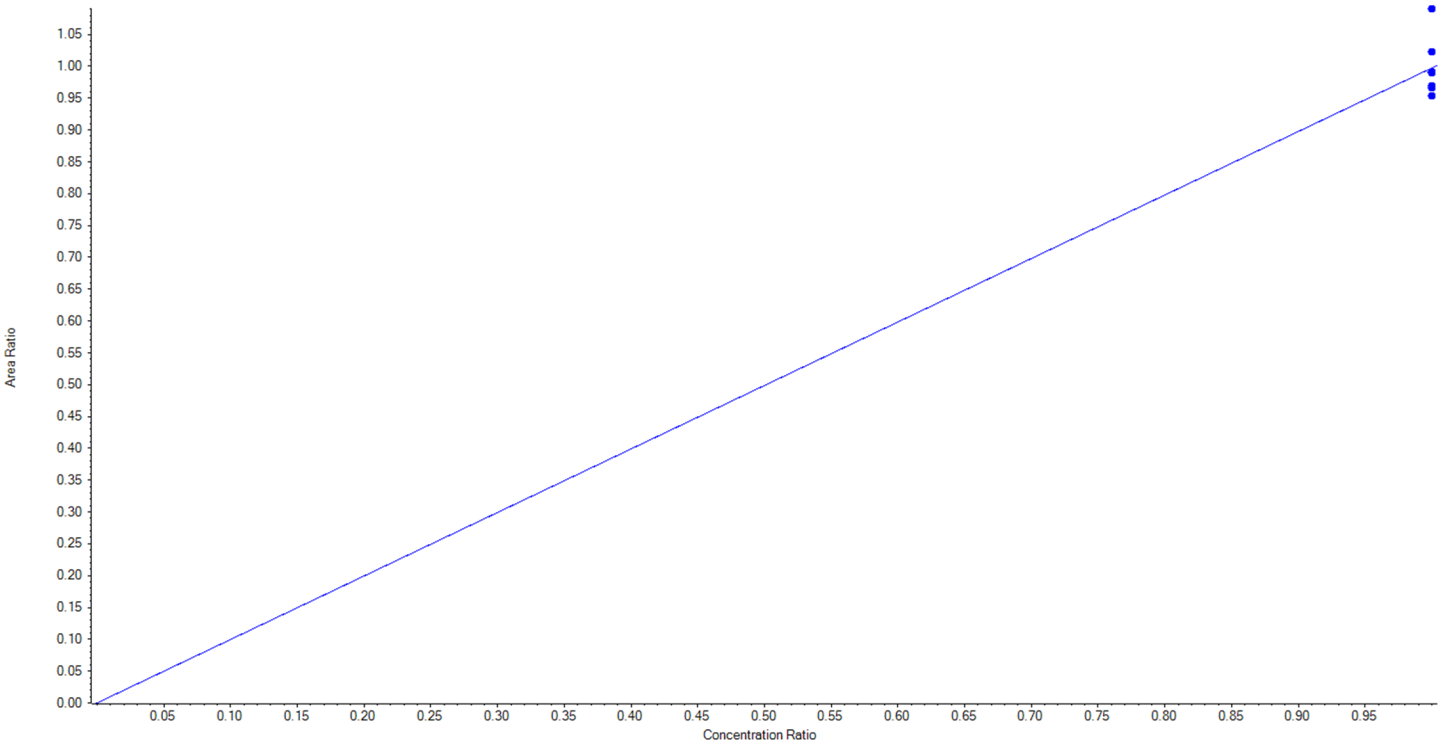
Calibration Summary Report

Analyte Name	13C6-PFDA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	519.0 / 474.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.99732 x (std. dev. = 0.04664) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	238.98	95.6
3	KP82	L2	True	250.00	248.33	99.3
4	KP83	L3	True	250.00	273.29	109.3
5	KP84	L4	True	250.00	248.14	99.3
6	KP85	L5	True	250.00	256.19	102.5
7	KP86	L6	True	250.00	242.10	96.8
8	KP87	L7	True	250.00	242.98	97.2



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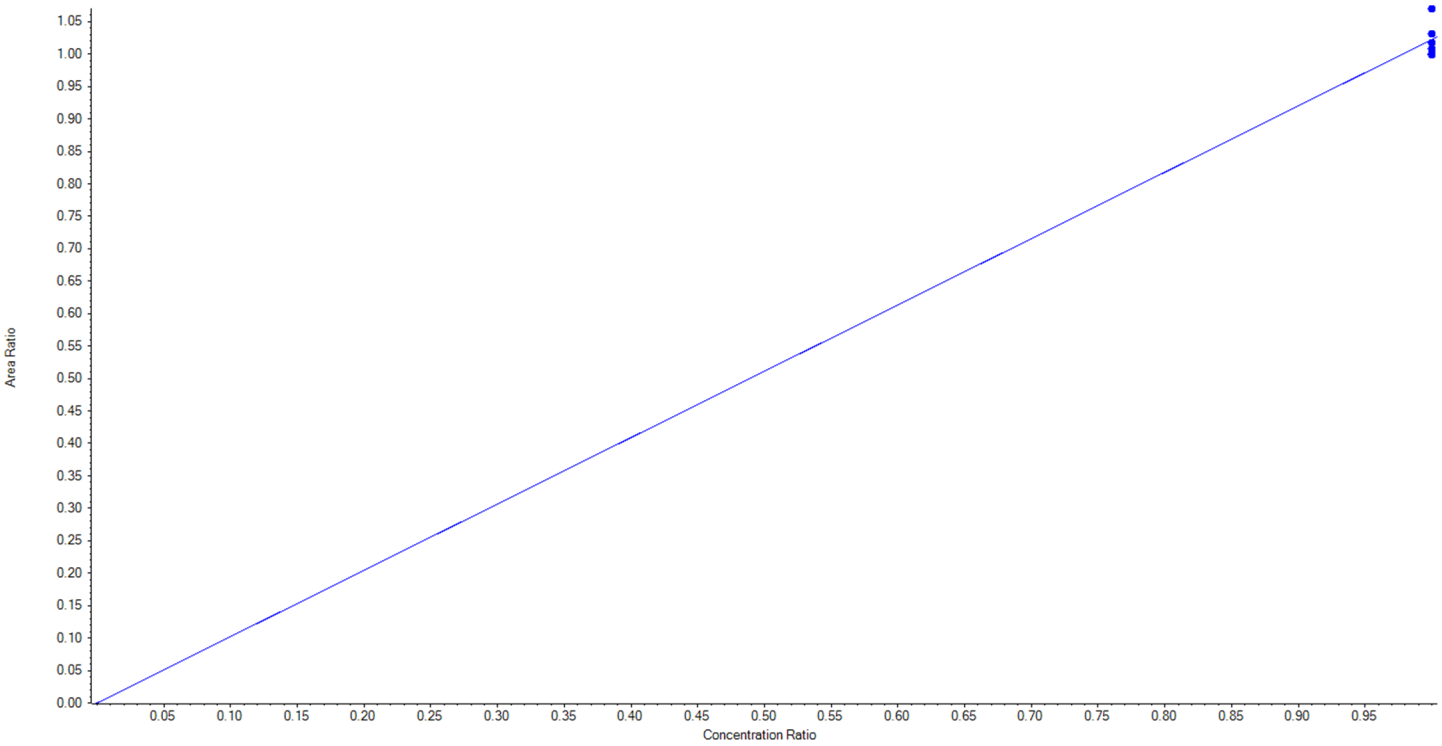
Calibration Summary Report

Analyte Name	13C7-PFUnA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	570.0 / 525.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.02235 x (std. dev. = 0.02459) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	252.12	100.9
3	KP82	L2	True	250.00	244.33	97.7
4	KP83	L3	True	250.00	246.35	98.5
5	KP84	L4	True	250.00	244.75	97.9
6	KP85	L5	True	250.00	261.56	104.6
7	KP86	L6	True	250.00	252.07	100.8
8	KP87	L7	True	250.00	248.81	99.5



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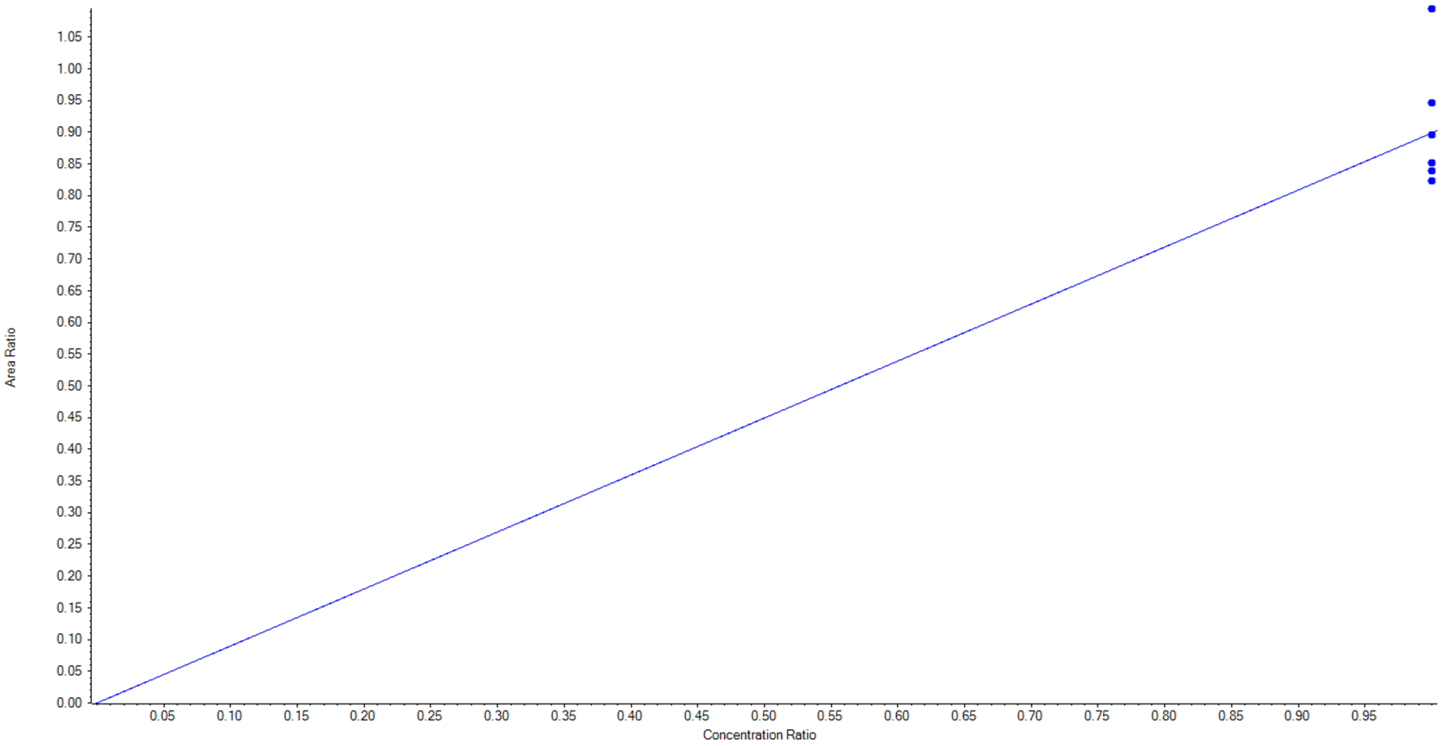
Calibration Summary Report

Analyte Name	13C2-PFTeDA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	715.0 / 670.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.89882 x (std. dev. = 0.09601) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	233.58	93.4
3	KP82	L2	True	250.00	229.17	91.7
4	KP83	L3	True	250.00	236.96	94.8
5	KP84	L4	True	250.00	233.59	93.4
6	KP85	L5	True	250.00	249.23	99.7
7	KP86	L6	True	250.00	263.01	105.2
8	KP87	L7	True	250.00	304.46	121.8



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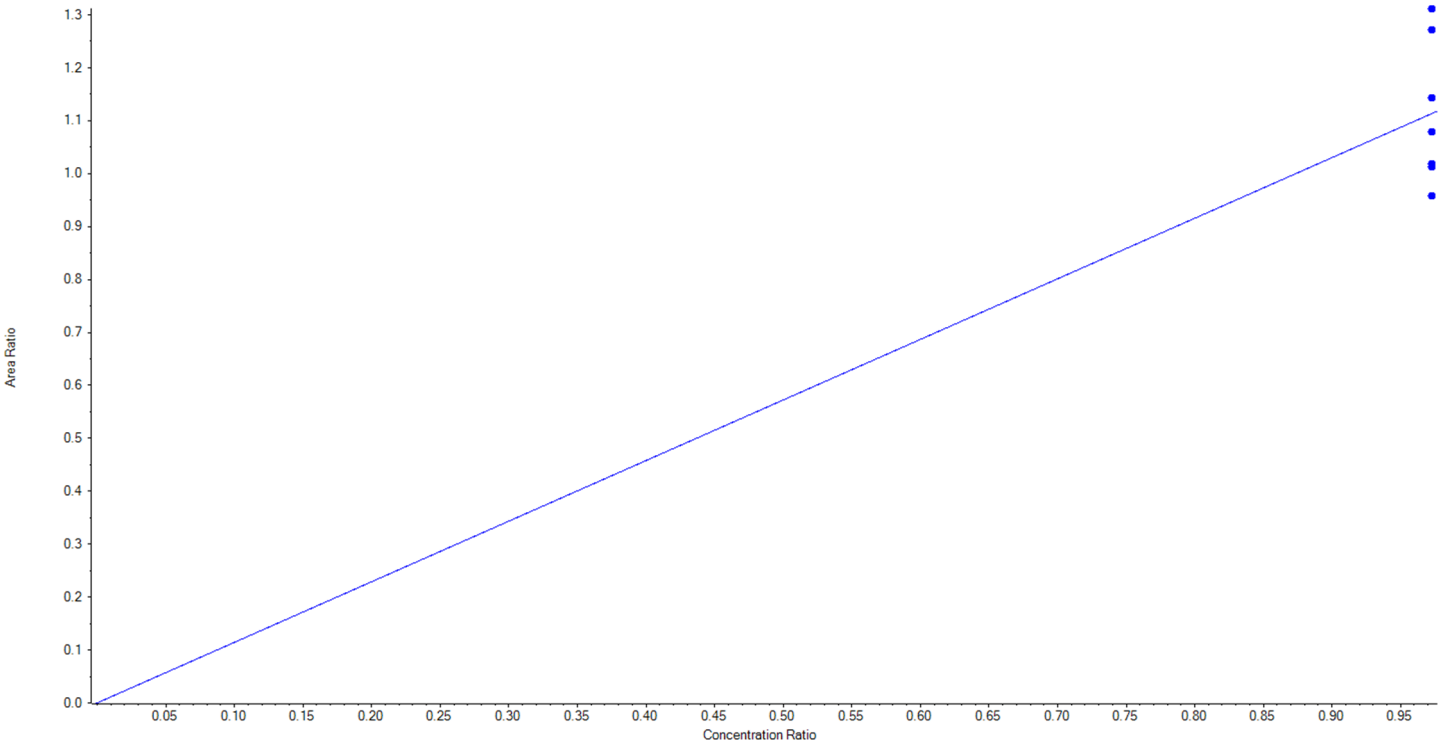
Calibration Summary Report

Analyte Name	13C3-PFBS	**Data File**	AC_09012019_5-369.wiff
MRM Transition	302.0 / 99.0	**Result Table**	19-0746_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.14464 x (std. dev. = 0.13886) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	232.25	238.40	102.7
3	KP82	L2	True	232.25	199.90	86.1
4	KP83	L3	True	232.25	211.42	91.0
5	KP84	L4	True	232.25	224.95	96.9
6	KP85	L5	True	232.25	212.30	91.4
7	KP86	L6	True	232.25	273.51	117.8
8	KP87	L7	True	232.25	265.27	114.2



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Calibration Summary Report

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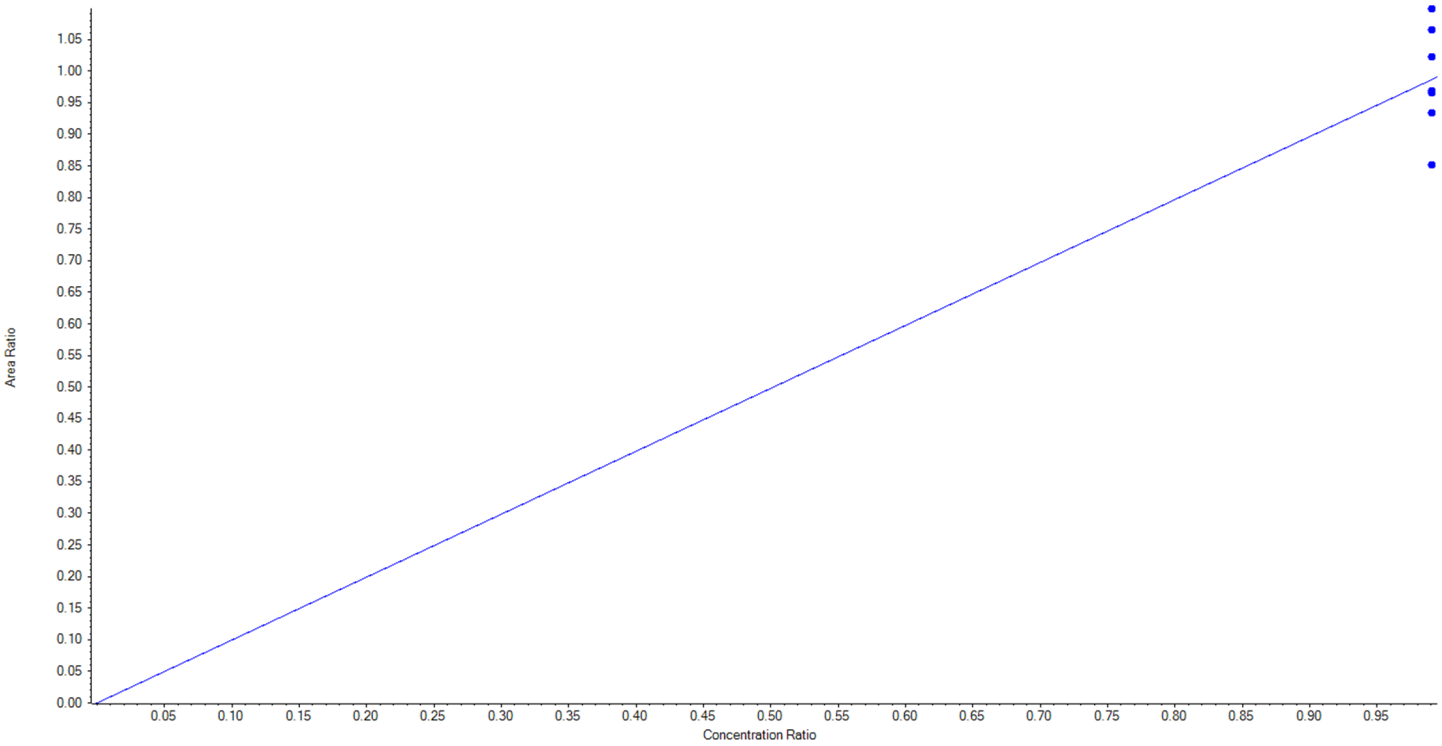
Analyte Name	13C3-PFHxS	**Data File**	AC_09012019_5-369.wiff
MRM Transition	402.0 / 99.0	**Result Table**	19-0746_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.99586 x (std. dev. = 0.08418) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	236.50	245.17	103.7
3	KP82	L2	True	236.50	223.92	94.7
4	KP83	L3	True	236.50	204.25	86.4
5	KP84	L4	True	236.50	232.08	98.1
6	KP85	L5	True	236.50	231.33	97.8
7	KP86	L6	True	236.50	255.40	108.0
8	KP87	L7	True	236.50	263.35	111.4



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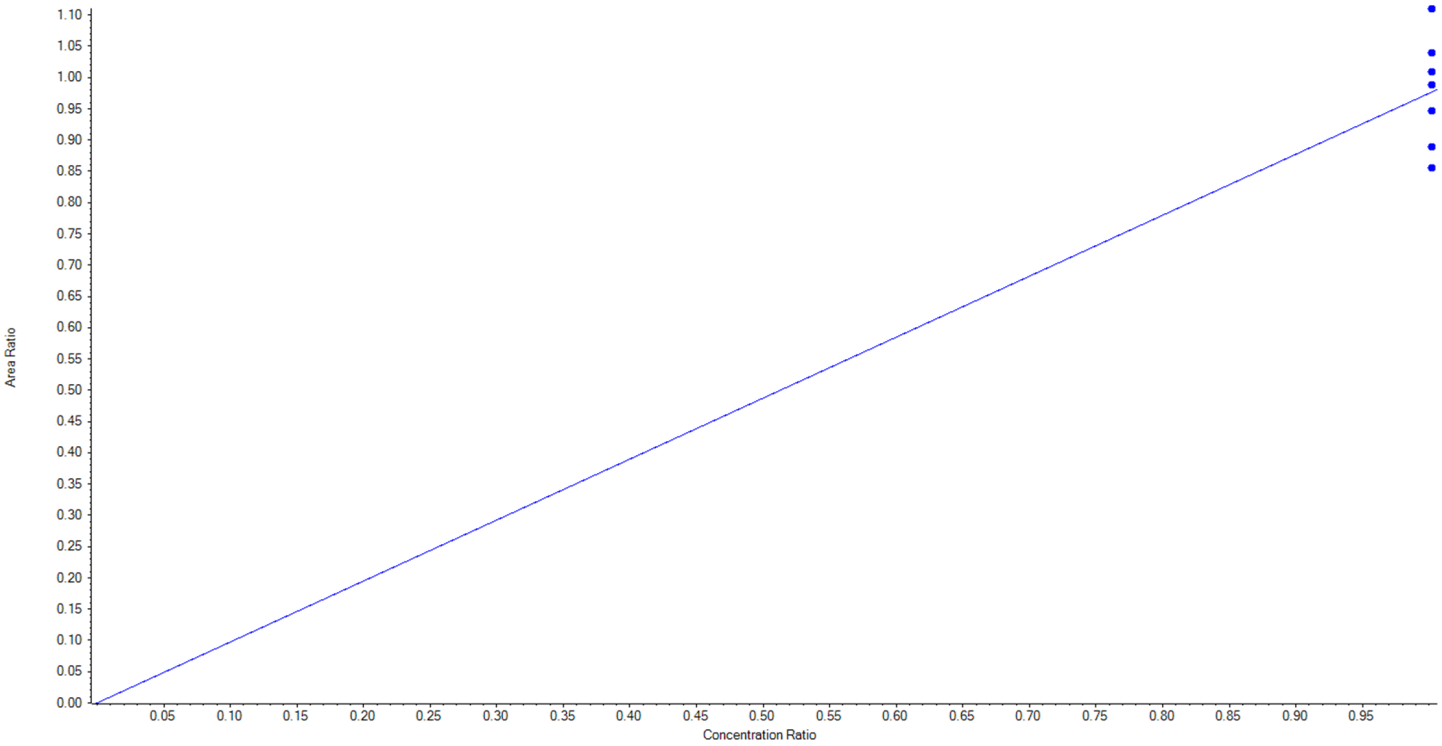
Calibration Summary Report

Analyte Name	13C8-PFOS	**Data File**	AC_09012019_5-369.wiff
MRM Transition	507.0 / 99.0	**Result Table**	19-0746_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.97479 x (std. dev. = 0.08758) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	239.25	247.34	103.4
3	KP82	L2	True	239.25	209.48	87.6
4	KP83	L3	True	239.25	242.14	101.2
5	KP84	L4	True	239.25	217.62	91.0
6	KP85	L5	True	239.25	231.93	96.9
7	KP86	L6	True	239.25	254.41	106.3
8	KP87	L7	True	239.25	271.83	113.6



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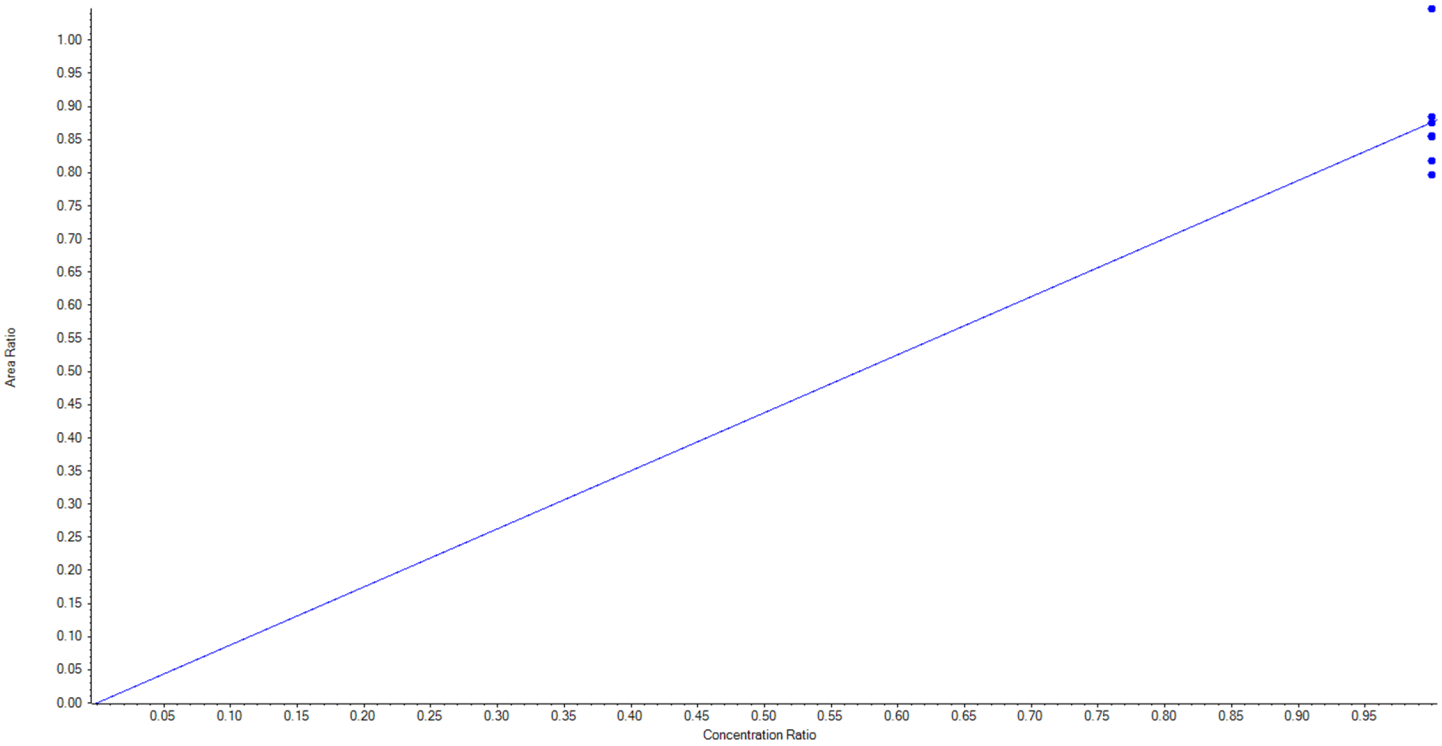
Calibration Summary Report

Analyte Name	13C3-HFPO-DA	**Data File**	AC_09012019_5-369.wiff
MRM Transition	287.0 / 169.0	**Result Table**	19-0746_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.87591 x (std. dev. = 0.08161) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
2	KP81	L1	True	250.00	243.59	97.4
3	KP82	L2	True	250.00	227.47	91.0
4	KP83	L3	True	250.00	249.72	99.9
5	KP84	L4	True	250.00	233.39	93.4
6	KP85	L5	True	250.00	244.35	97.7
7	KP86	L6	True	250.00	252.57	101.0
8	KP87	L7	True	250.00	298.91	119.6



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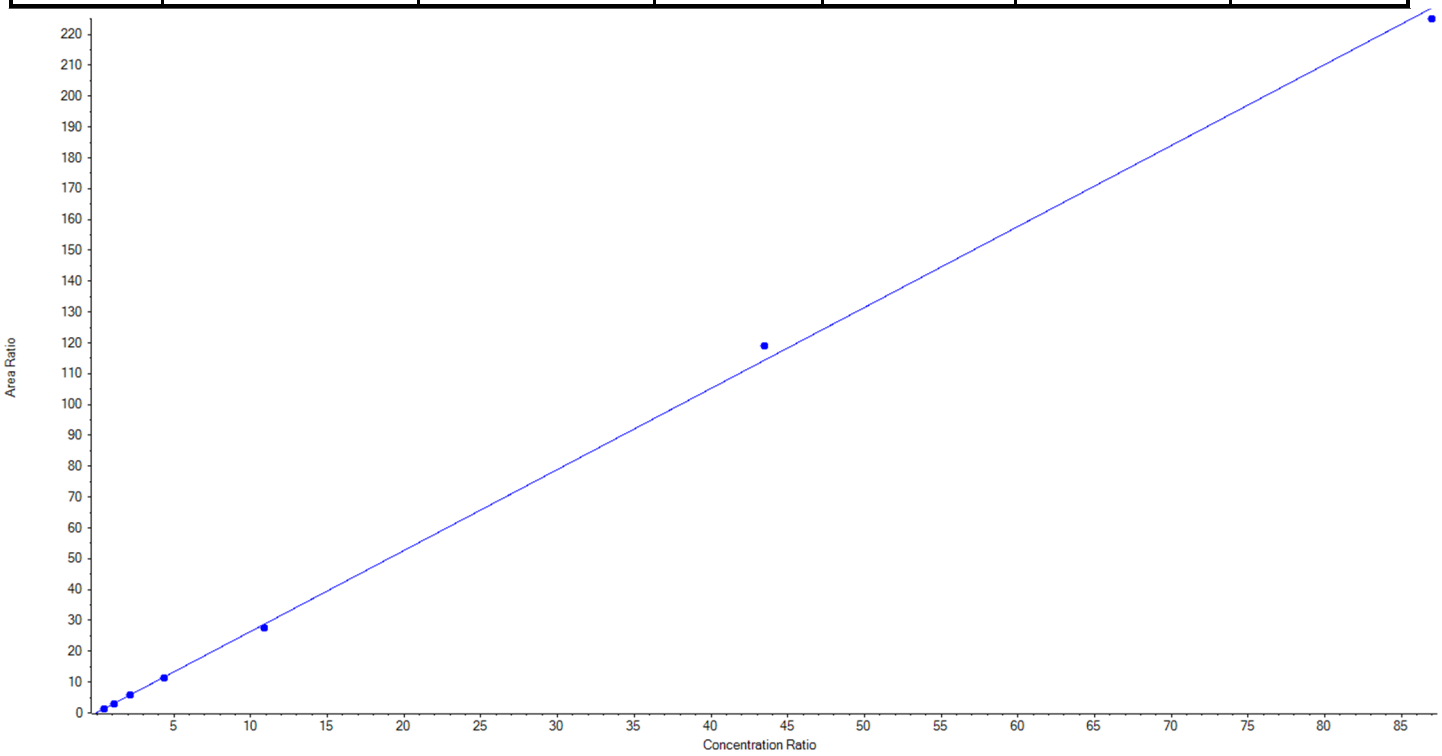
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFBS_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	298.9 / 80.0	**Result Table**	19-0746A
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 2.62615 x + 0.16847 (r = 0.99959) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	102.98	102.0
6	KP82	L2	True	252.50	255.43	101.2
7	KP83	L3	True	505.00	499.81	99.0
8	KP84	L4	True	1010.00	1002.48	99.3
9	KP85	L5	True	2525.00	2425.50	96.1
10	KP86	L6	True	10100.00	10516.79	104.1
11	KP87	L7	True	20200.00	19890.51	98.5



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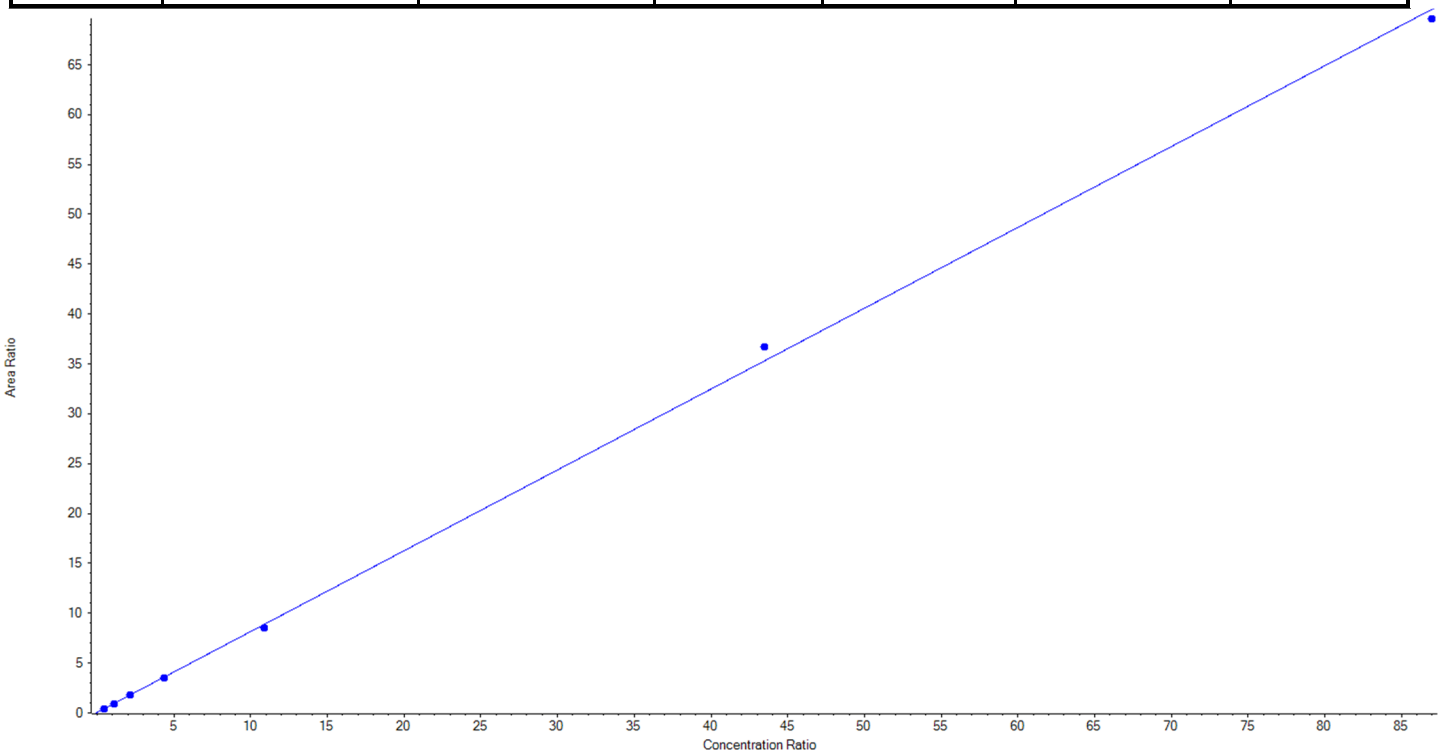
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFBS_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	298.9 / 99.0	**Result Table**	19-0746A
Internal Standard	13C3-PFBS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.81056 x + 0.05435 (r = 0.99957) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	110.11	109.0
6	KP82	L2	True	252.50	246.30	97.5
7	KP83	L3	True	505.00	494.72	98.0
8	KP84	L4	True	1010.00	978.08	96.8
9	KP85	L5	True	2525.00	2420.39	95.9
10	KP86	L6	True	10100.00	10516.19	104.1
11	KP87	L7	True	20200.00	19927.72	98.7



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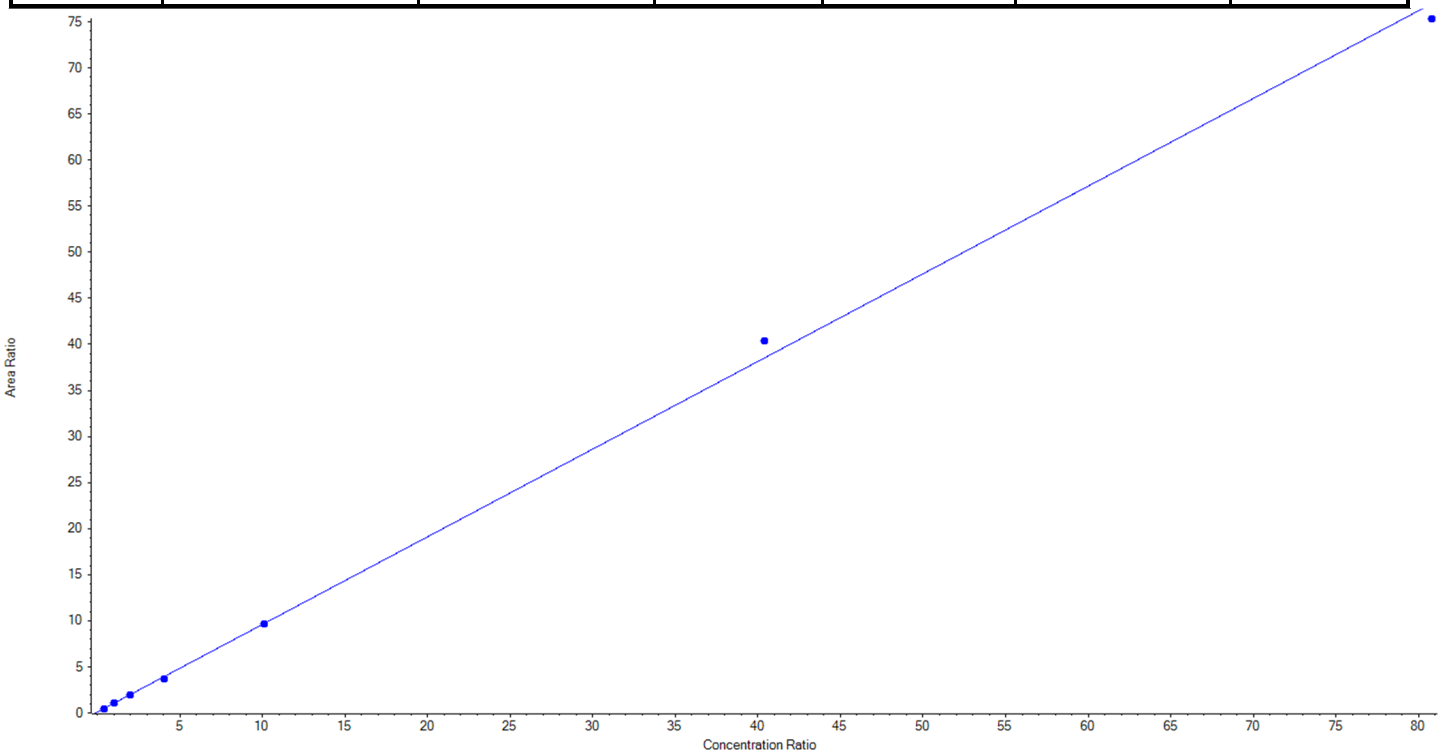
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	313.0 / 269.0	**Result Table**	19-0746A
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.95149 x + 0.08469 (r = 0.99941) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	95.00	94.1
6	KP82	L2	True	252.50	276.85	109.6
7	KP83	L3	True	505.00	501.50	99.3
8	KP84	L4	True	1010.00	957.95	94.9
9	KP85	L5	True	2525.00	2512.91	99.5
10	KP86	L6	True	10100.00	10580.65	104.8
11	KP87	L7	True	20200.00	19768.64	97.9



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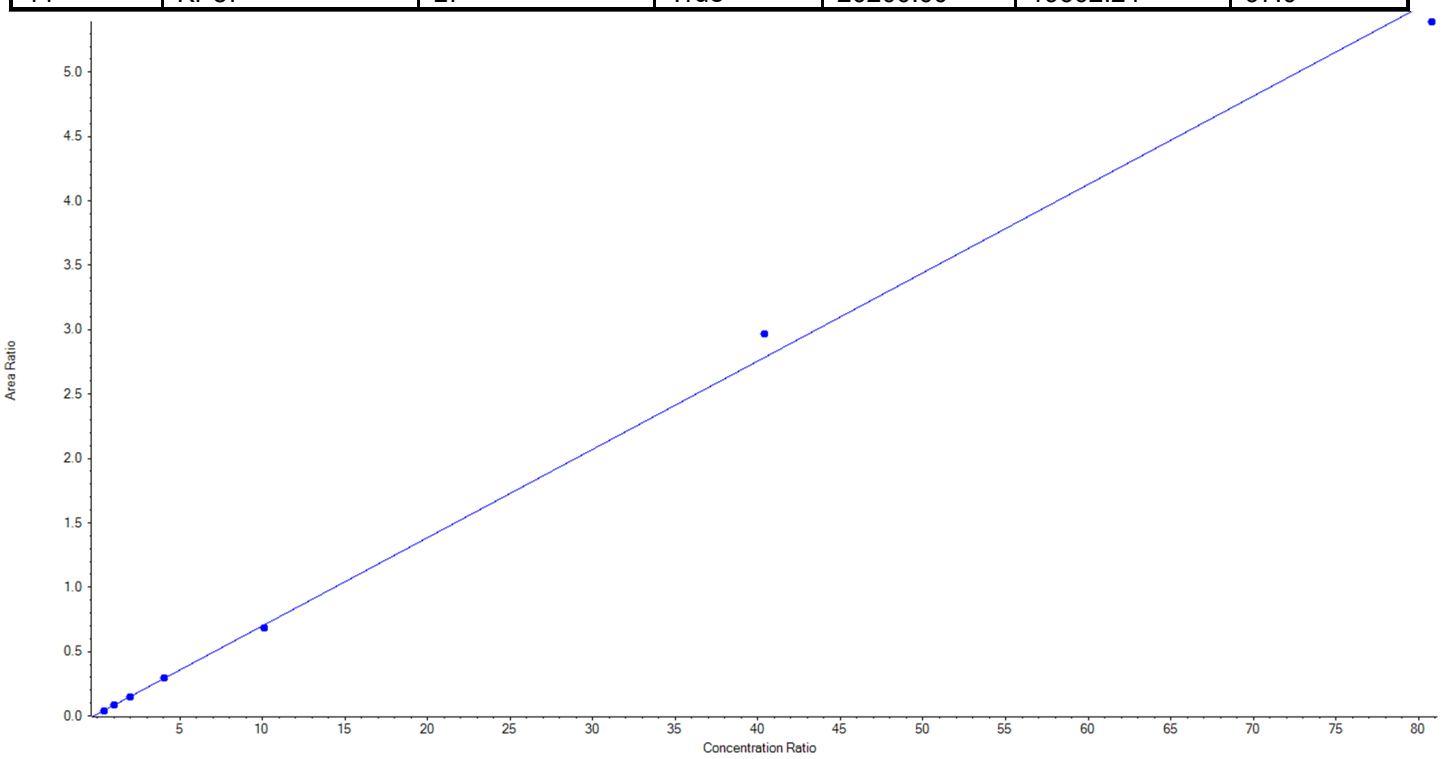
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	313.0 / 119.0	**Result Table**	19-0746A
Internal Standard	13C5-PFHxA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.06859 x + 0.01320 (r = 0.99899) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	98.46	97.5
6	KP82	L2	True	252.50	259.36	102.7
7	KP83	L3	True	505.00	491.37	97.3
8	KP84	L4	True	1010.00	1029.27	101.9
9	KP85	L5	True	2525.00	2448.55	97.0
10	KP86	L6	True	10100.00	10764.25	106.6
11	KP87	L7	True	20200.00	19602.24	97.0



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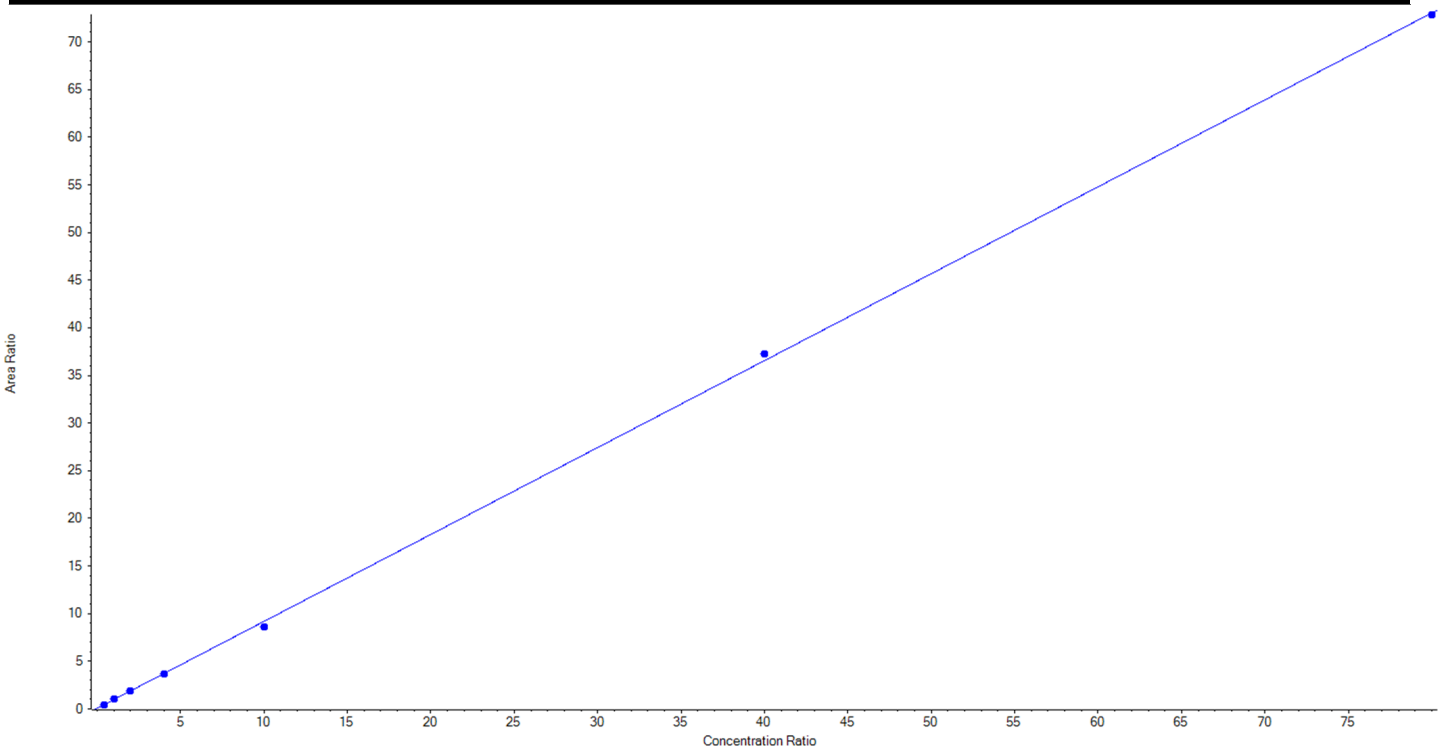
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHpA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	363.0 / 319.0	**Result Table**	19-0746A
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.91216 x + 0.06581 (r = 0.99974) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	96.85	96.9
6	KP82	L2	True	250.00	274.72	109.9
7	KP83	L3	True	500.00	490.34	98.1
8	KP84	L4	True	1000.00	995.98	99.6
9	KP85	L5	True	2500.00	2346.63	93.9
10	KP86	L6	True	10000.00	10200.98	102.0
11	KP87	L7	True	20000.00	19944.51	99.7



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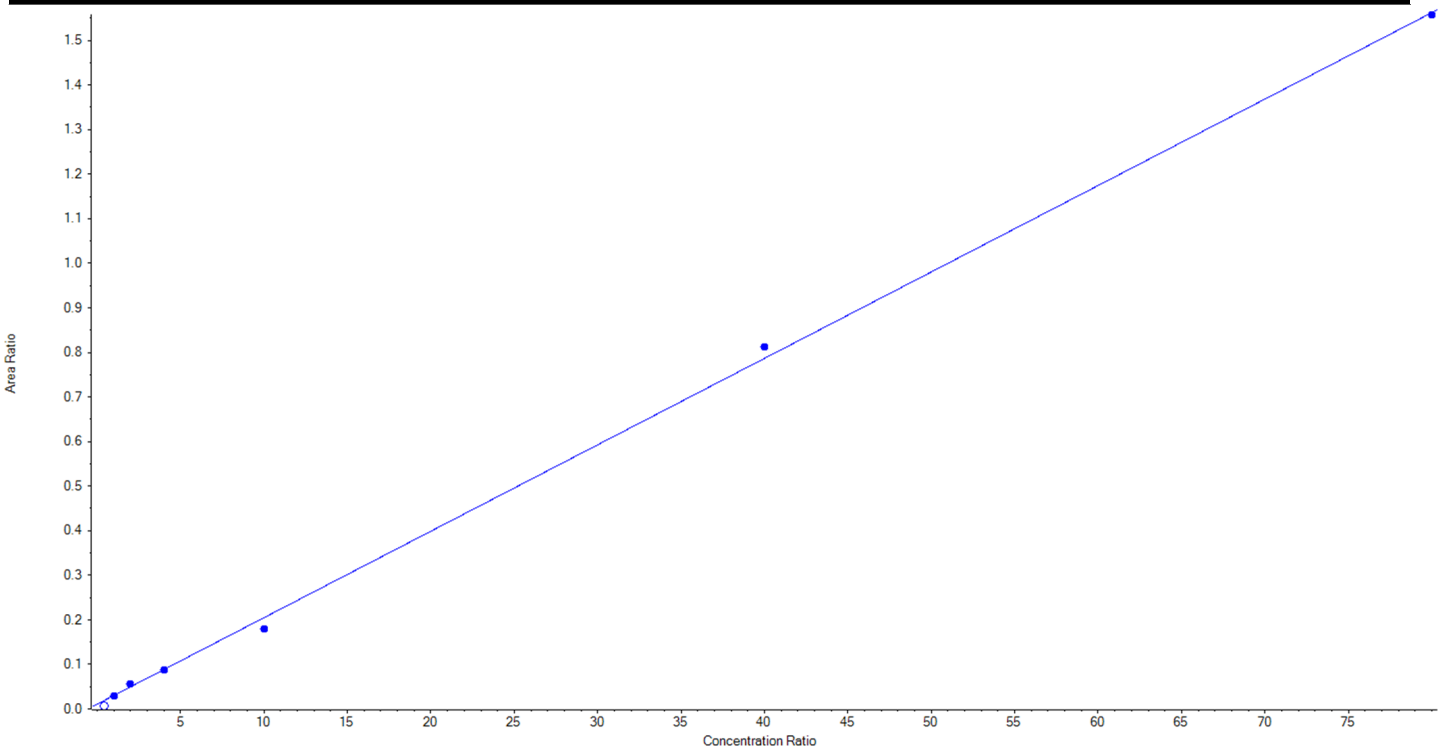
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHpA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	363.0 / 169.0	**Result Table**	19-0746A
Internal Standard	13C4-PFHpA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.01939 x + 0.01087 (r = 0.99875) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	False	100.00	< 0	N/A
6	KP82	L2	True	250.00	235.03	94.0
7	KP83	L3	True	500.00	587.86	117.6
8	KP84	L4	True	1000.00	988.16	98.8
9	KP85	L5	True	2500.00	2163.08	86.5
10	KP86	L6	True	10000.00	10339.80	103.4
11	KP87	L7	True	20000.00	19936.08	99.7



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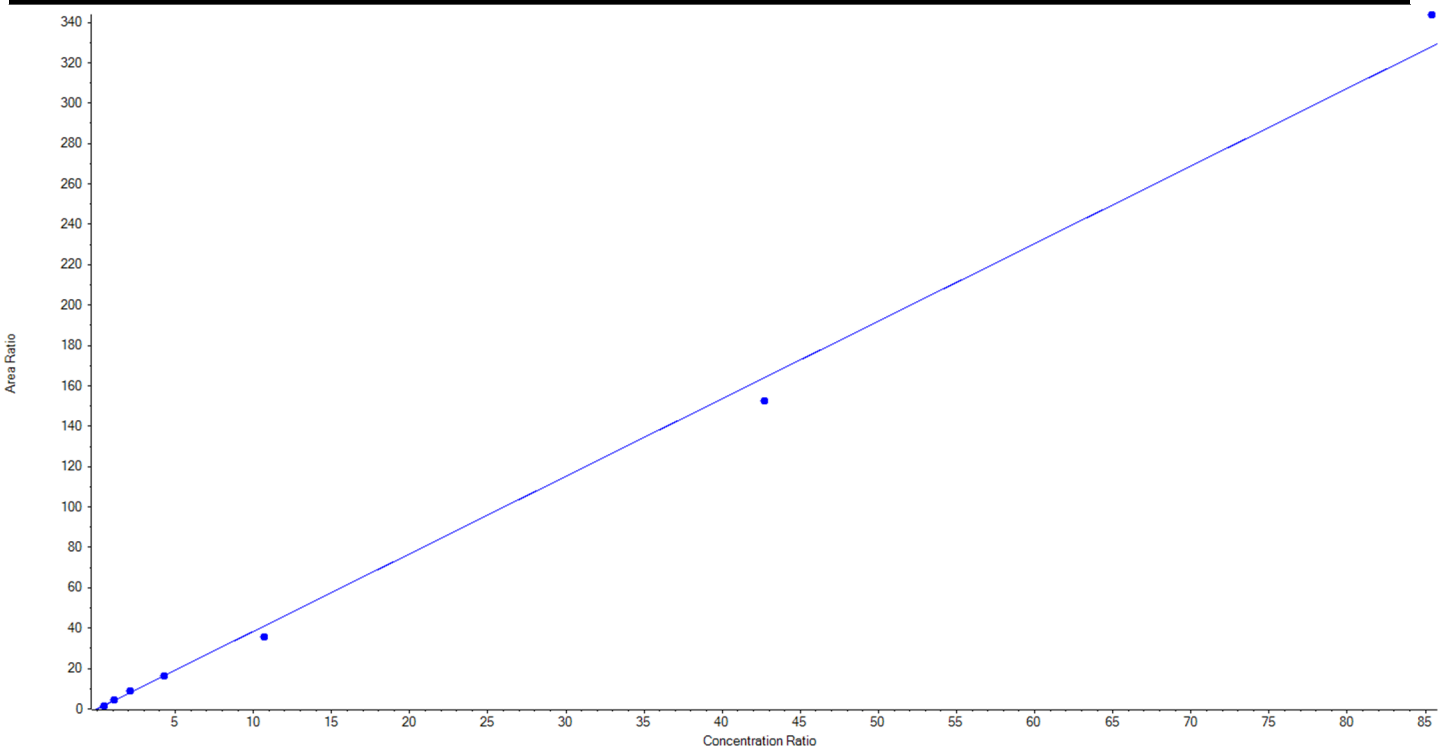
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxS_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	399.0 / 80.0	**Result Table**	19-0746A
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 3.84045 x + 0.02138 (r = 0.99784) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	102.87	101.9
6	KP82	L2	True	252.50	269.91	106.9
7	KP83	L3	True	505.00	535.64	106.1
8	KP84	L4	True	1010.00	1010.19	100.0
9	KP85	L5	True	2525.00	2203.21	87.3
10	KP86	L6	True	10100.00	9406.13	93.1
11	KP87	L7	True	20200.00	21165.55	104.8



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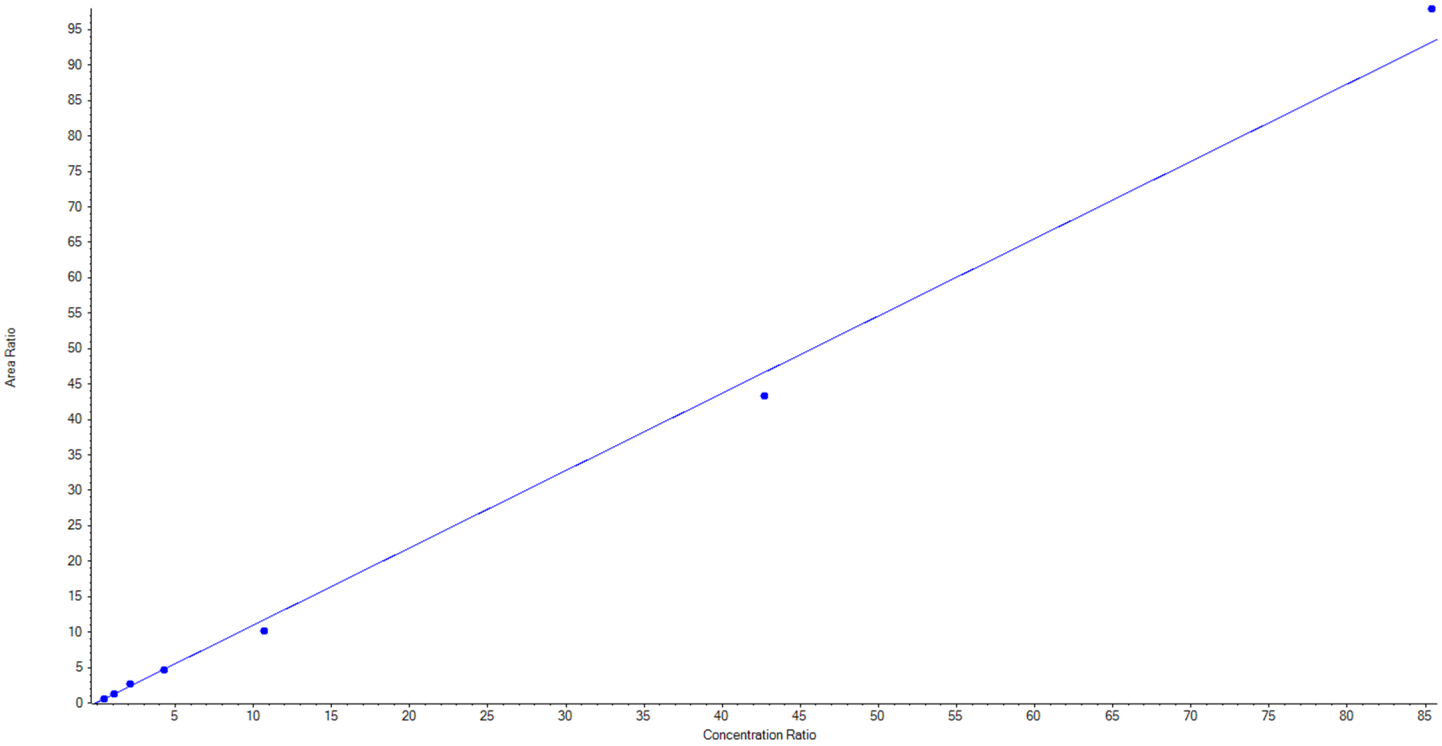
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFHxS_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	399.0 / 99.0	**Result Table**	19-0746A
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.09061 x + 0.07578 (r = 0.99752) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	104.39	103.4
6	KP82	L2	True	252.50	257.22	101.9
7	KP83	L3	True	505.00	569.29	112.7
8	KP84	L4	True	1010.00	985.57	97.6
9	KP85	L5	True	2525.00	2188.16	86.7
10	KP86	L6	True	10100.00	9367.52	92.8
11	KP87	L7	True	20200.00	21221.36	105.1



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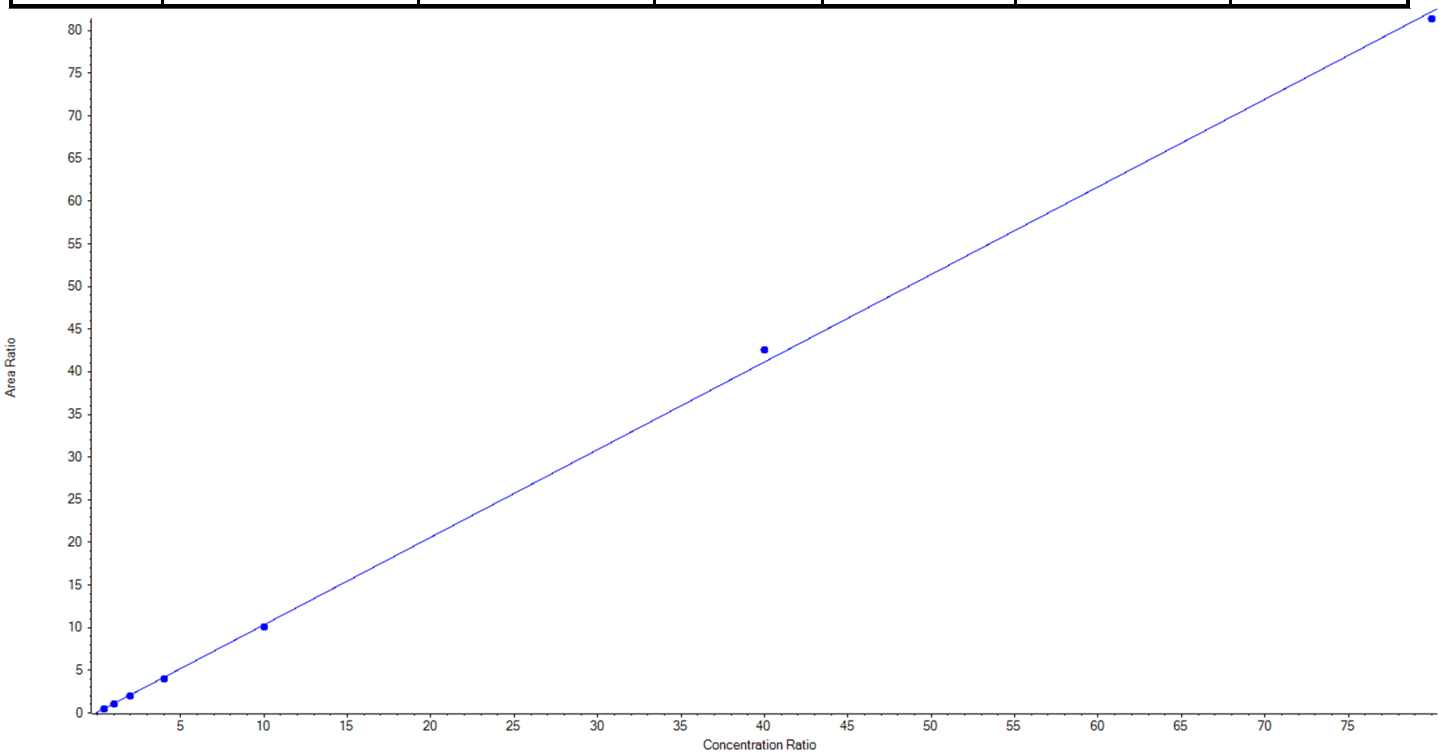
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	413.0 / 369.0	**Result Table**	19-0746A
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.02702 x + 0.06284 (r = 0.99968) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	108.36	108.4
6	KP82	L2	True	250.00	254.77	101.9
7	KP83	L3	True	500.00	478.54	95.7
8	KP84	L4	True	1000.00	944.07	94.4
9	KP85	L5	True	2500.00	2431.23	97.3
10	KP86	L6	True	10000.00	10339.89	103.4
11	KP87	L7	True	20000.00	19793.13	99.0



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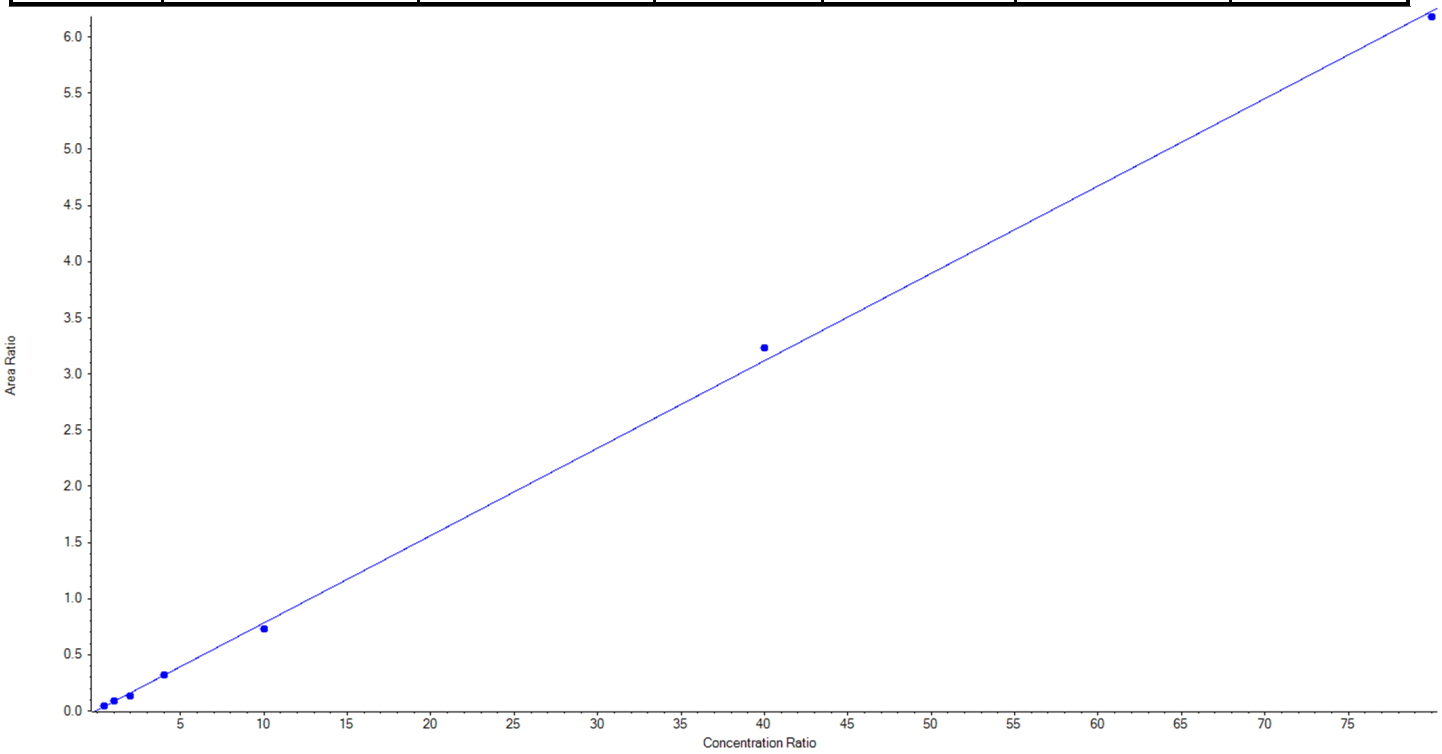
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	413.0 / 169.0	**Result Table**	19-0746A
Internal Standard	13C8-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.07780 x + 0.00562 (r = 0.99934) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	113.12	113.1
6	KP82	L2	True	250.00	265.83	106.3
7	KP83	L3	True	500.00	421.34	84.3
8	KP84	L4	True	1000.00	999.70	100.0
9	KP85	L5	True	2500.00	2333.44	93.3
10	KP86	L6	True	10000.00	10378.38	103.8
11	KP87	L7	True	20000.00	19838.20	99.2



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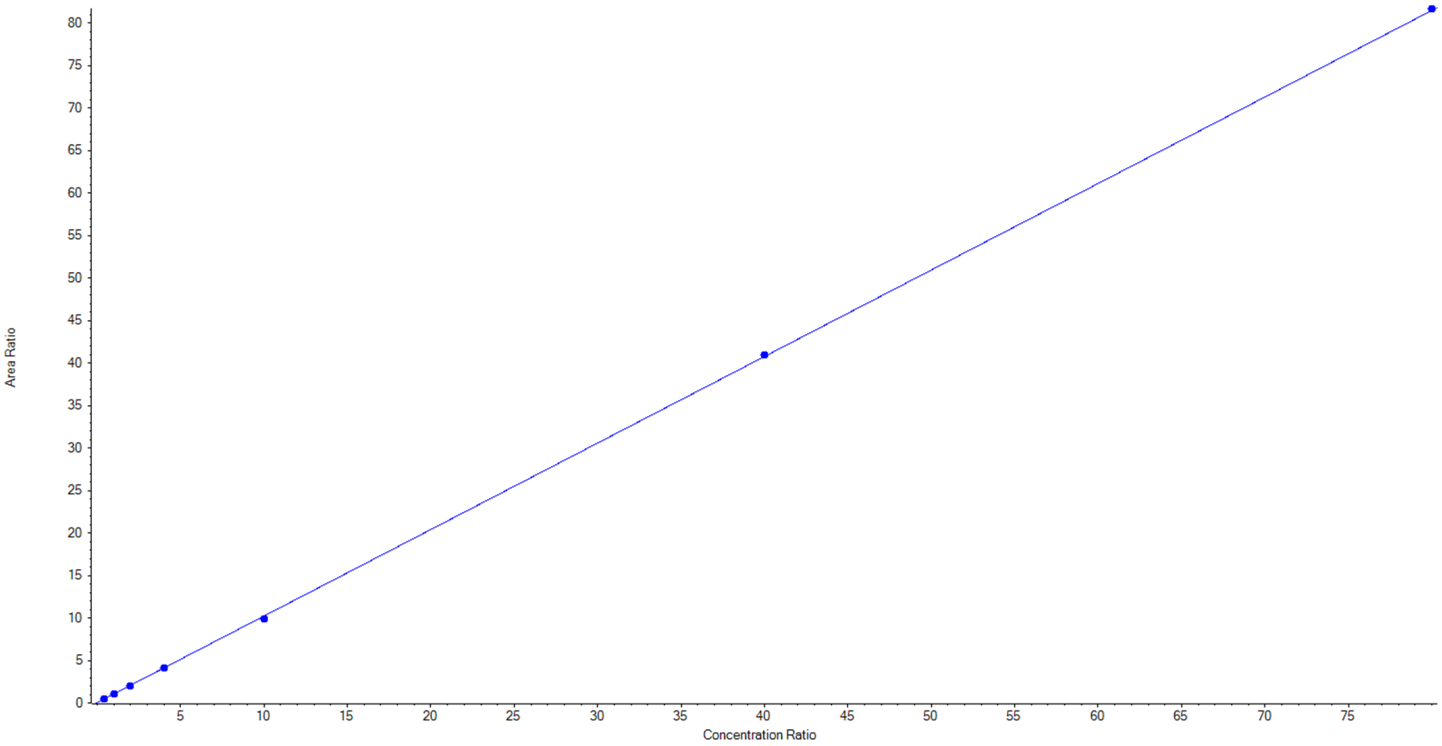
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFNA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	463.0 / 419.0	**Result Table**	19-0746A
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.01815 x + 0.04625 (r = 0.99993) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	99.83	99.8
6	KP82	L2	True	250.00	261.79	104.7
7	KP83	L3	True	500.00	493.10	98.6
8	KP84	L4	True	1000.00	1000.14	100.0
9	KP85	L5	True	2500.00	2403.49	96.1
10	KP86	L6	True	10000.00	10044.67	100.5
11	KP87	L7	True	20000.00	20046.98	100.2



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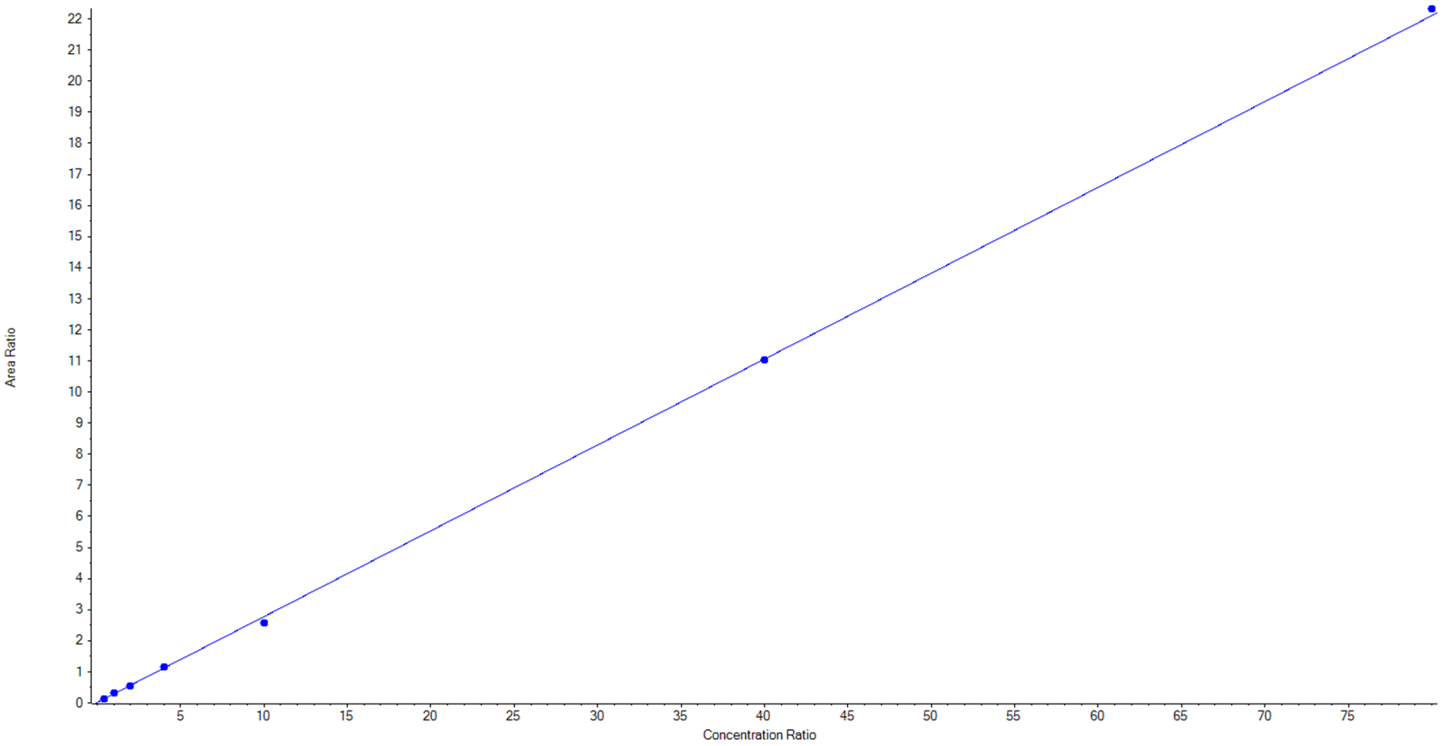
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFNA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	463.0 / 219.0	**Result Table**	19-0746A
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.27615 x + 0.01517 (r = 0.99965) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	100.44	100.4
6	KP82	L2	True	250.00	272.35	108.9
7	KP83	L3	True	500.00	468.81	93.8
8	KP84	L4	True	1000.00	1039.01	103.9
9	KP85	L5	True	2500.00	2308.65	92.4
10	KP86	L6	True	10000.00	9961.89	99.6
11	KP87	L7	True	20000.00	20198.85	101.0



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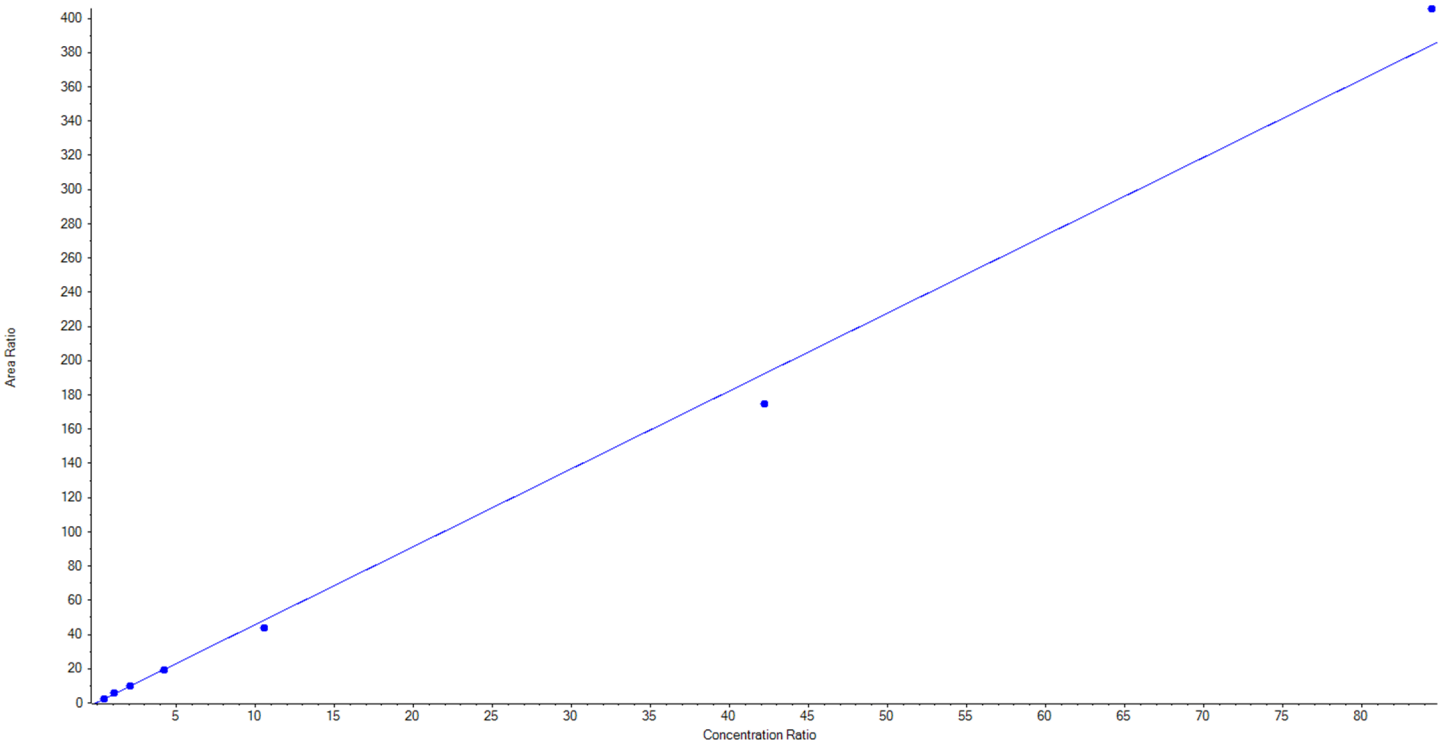
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOS_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	499.0 / 80.0	**Result Table**	19-0746A
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 4.55027 x + 0.29693 (r = 0.99731) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	96.78	95.8
6	KP82	L2	True	252.50	292.12	115.7
7	KP83	L3	True	505.00	513.68	101.7
8	KP84	L4	True	1010.00	1005.71	99.6
9	KP85	L5	True	2525.00	2292.11	90.8
10	KP86	L6	True	10100.00	9182.95	90.9
11	KP87	L7	True	20200.00	21310.16	105.5



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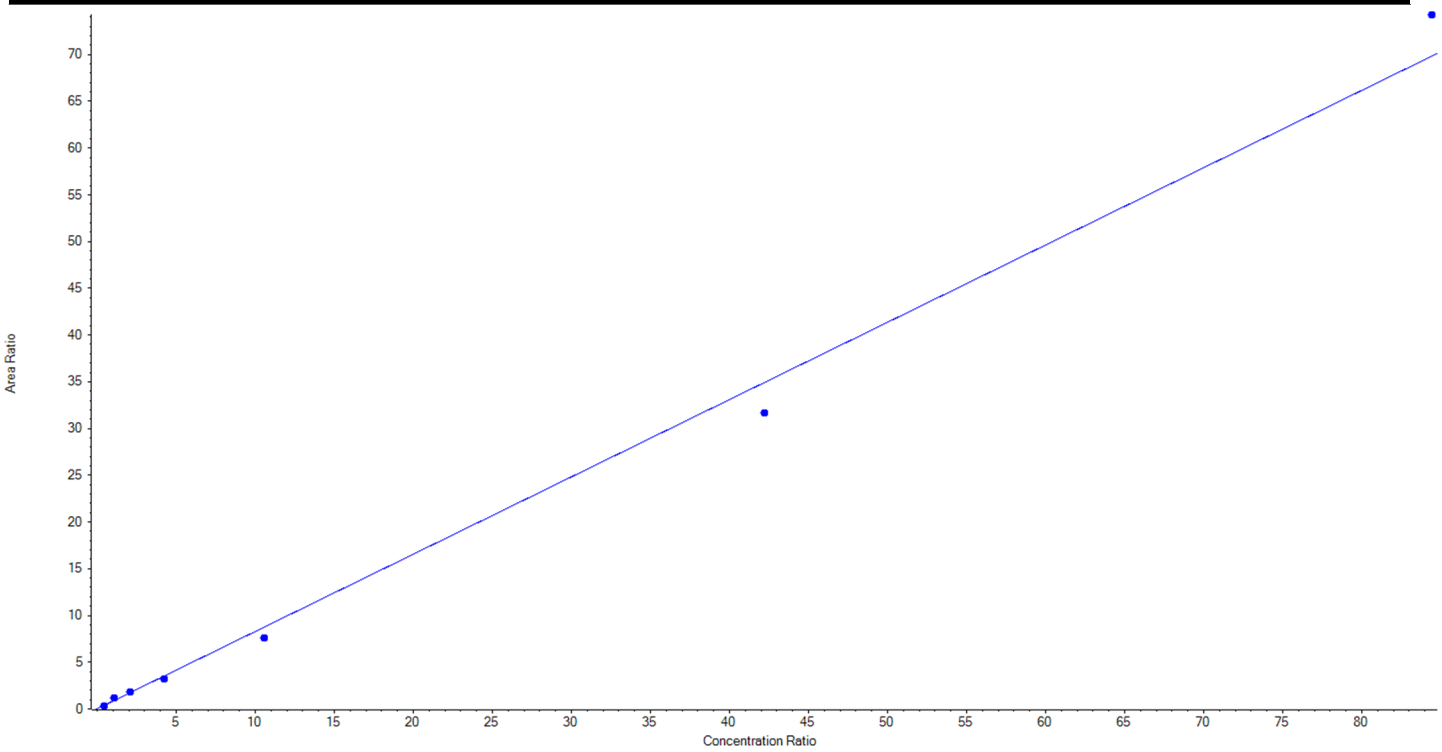
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFOS_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	499.0 / 99.0	**Result Table**	19-0746A
Internal Standard	13C8-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.82694 x + 0.01738 (r = 0.99630) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	101.00	94.78	93.8
6	KP82	L2	True	252.50	323.58	128.2
7	KP83	L3	True	505.00	509.42	100.9
8	KP84	L4	True	1010.00	938.27	92.9
9	KP85	L5	True	2525.00	2206.36	87.4
10	KP86	L6	True	10100.00	9143.49	90.5
11	KP87	L7	True	20200.00	21477.59	106.3



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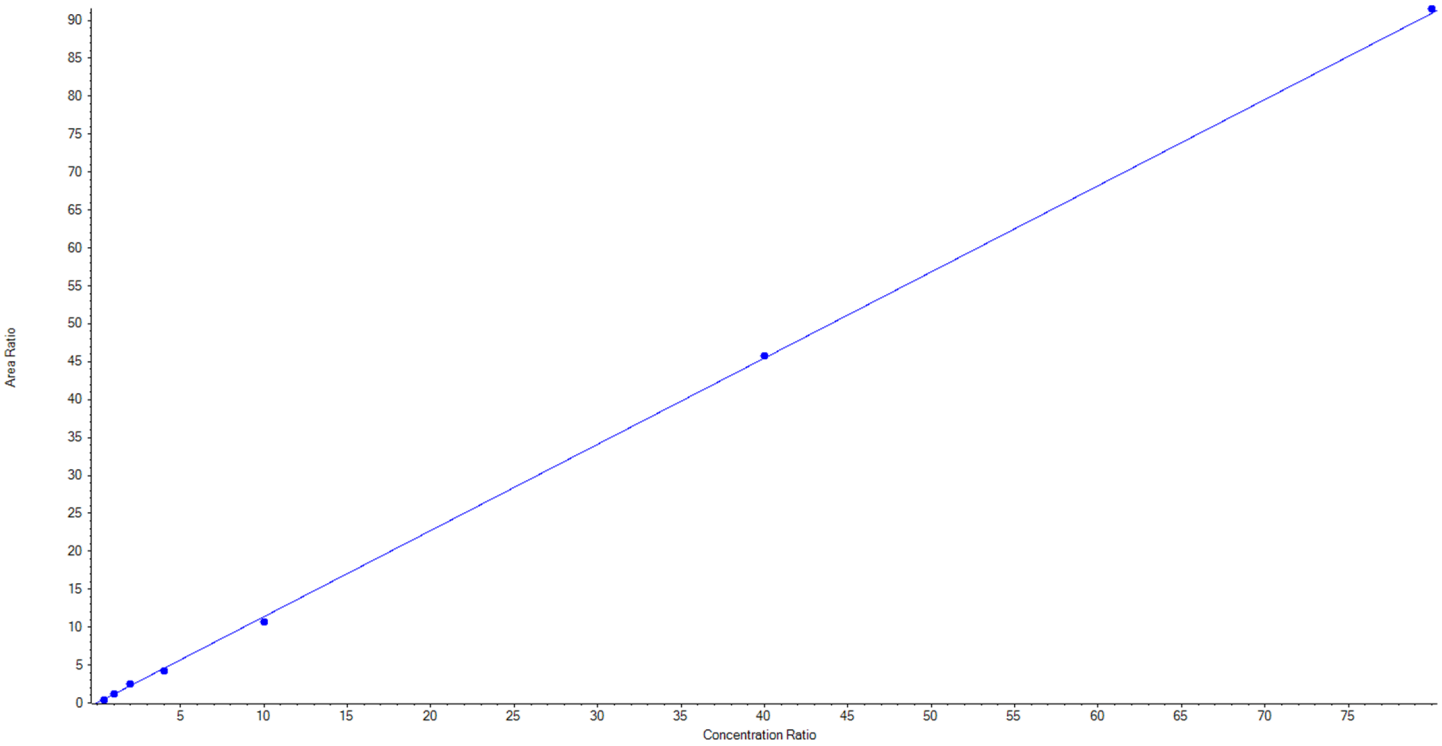
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	513.0 / 469.0	**Result Table**	19-0746A
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.13662 x + 0.00947 (r = 0.99959) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	95.50	95.5
6	KP82	L2	True	250.00	272.84	109.1
7	KP83	L3	True	500.00	545.89	109.2
8	KP84	L4	True	1000.00	916.26	91.6
9	KP85	L5	True	2500.00	2333.75	93.4
10	KP86	L6	True	10000.00	10056.55	100.6
11	KP87	L7	True	20000.00	20129.22	100.7



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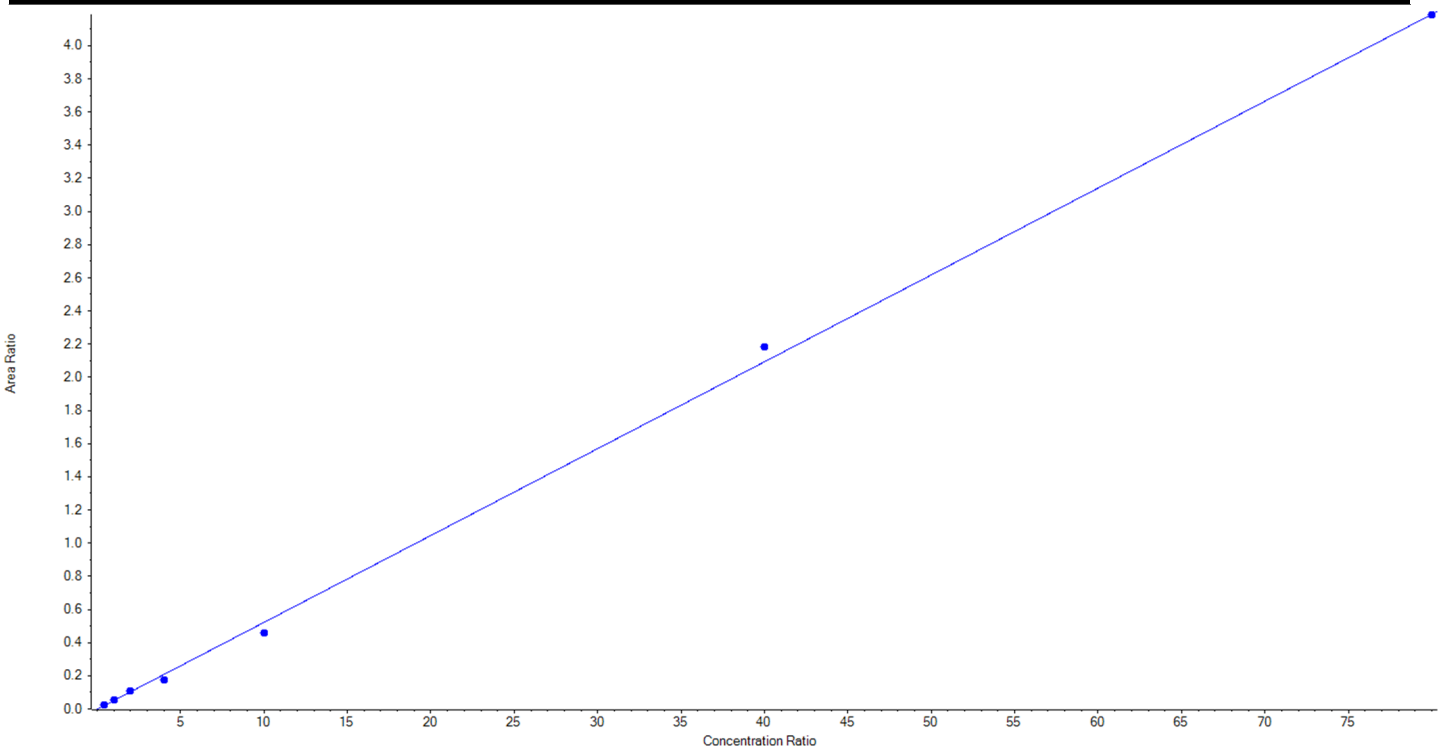
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	513.0 / 219.0	**Result Table**	19-0746A
Internal Standard	13C6-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.05238 x + -0.00180 (r = 0.99864) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	110.29	110.3
6	KP82	L2	True	250.00	268.00	107.2
7	KP83	L3	True	500.00	531.43	106.3
8	KP84	L4	True	1000.00	847.36	84.7
9	KP85	L5	True	2500.00	2182.83	87.3
10	KP86	L6	True	10000.00	10424.83	104.3
11	KP87	L7	True	20000.00	19985.26	99.9



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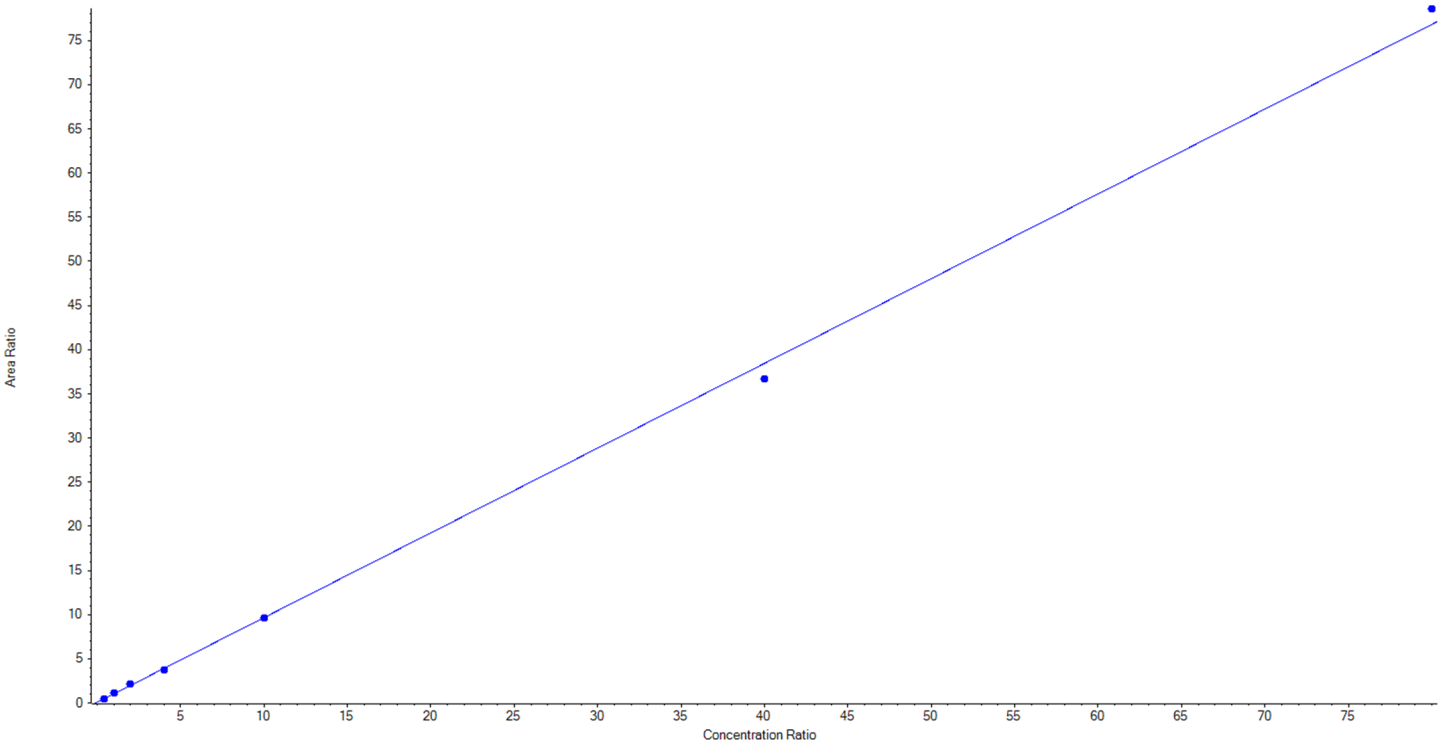
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFUnA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	563.0 / 519.0	**Result Table**	19-0746A
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.95957 x + 0.06523 (r = 0.99941) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	93.21	93.2
6	KP82	L2	True	250.00	269.08	107.6
7	KP83	L3	True	500.00	534.61	106.9
8	KP84	L4	True	1000.00	946.60	94.7
9	KP85	L5	True	2500.00	2493.48	99.7
10	KP86	L6	True	10000.00	9555.53	95.6
11	KP87	L7	True	20000.00	20457.50	102.3



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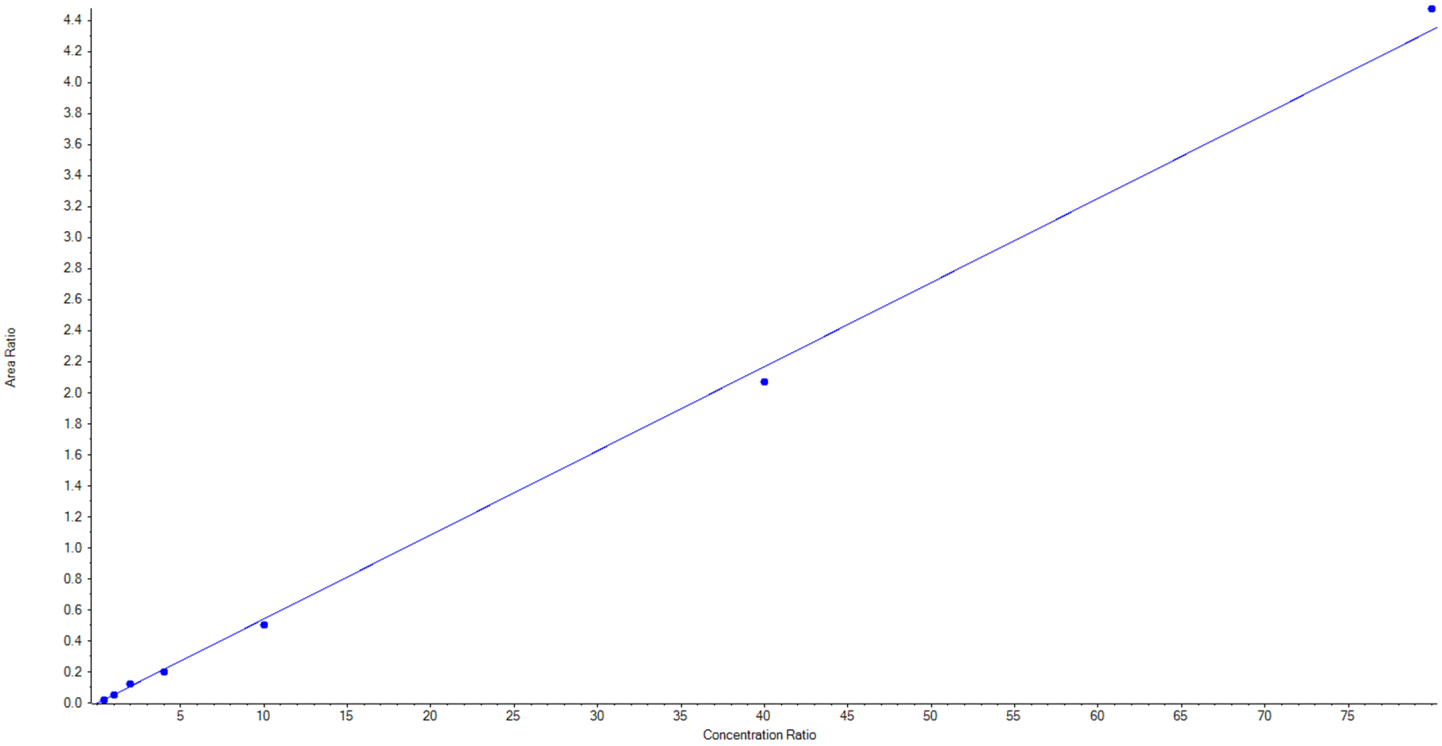
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFUnA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	563.0 / 269.0	**Result Table**	19-0746A
Internal Standard	13C7-PFUnA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.05423 x + -8.68506e-4 (r = 0.99895) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	101.38	101.4
6	KP82	L2	True	250.00	250.87	100.4
7	KP83	L3	True	500.00	564.52	112.9
8	KP84	L4	True	1000.00	938.06	93.8
9	KP85	L5	True	2500.00	2326.21	93.1
10	KP86	L6	True	10000.00	9533.24	95.3
11	KP87	L7	True	20000.00	20635.73	103.2



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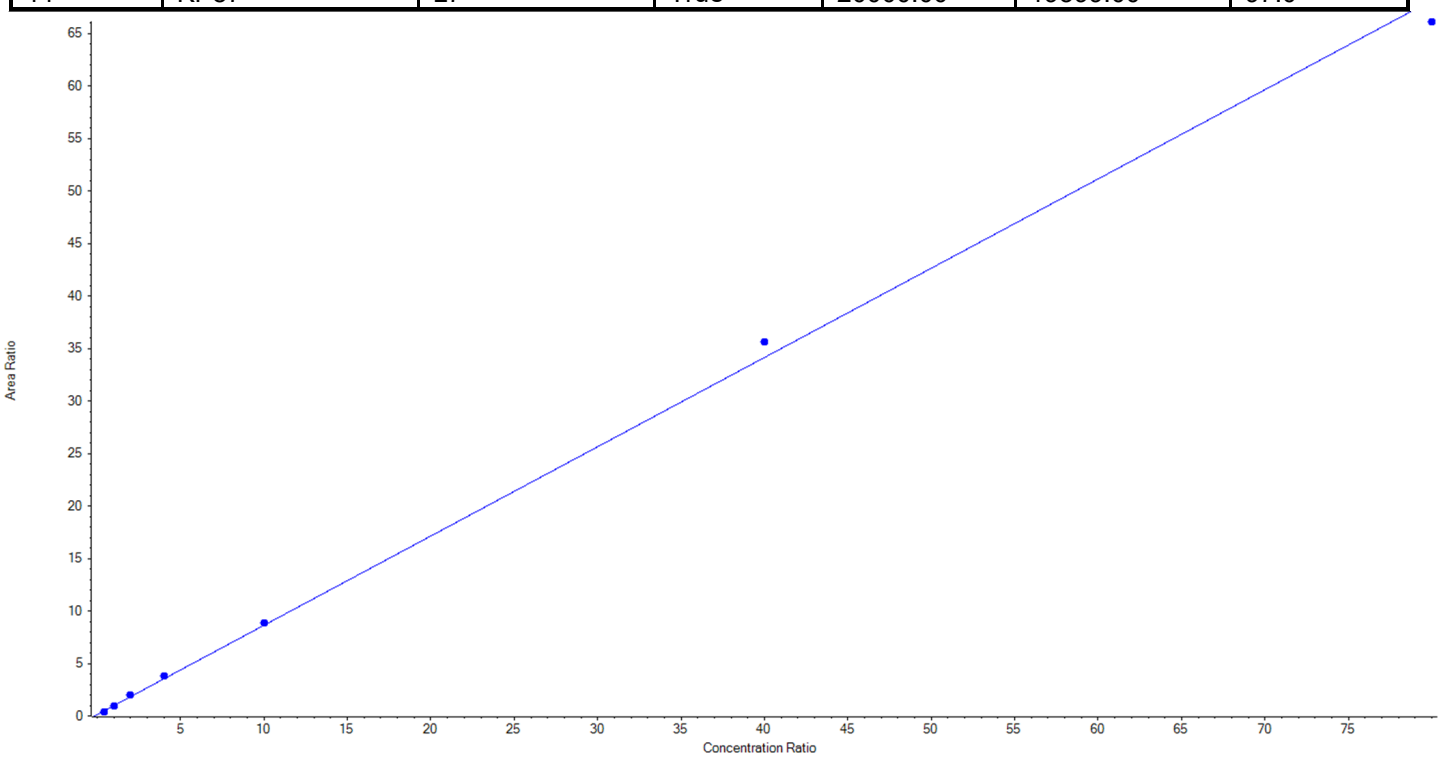
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDoA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	613.0 / 569.0	**Result Table**	19-0746A
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.85041 x + 0.13263 (r = 0.99916) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	78.55	78.6
6	KP82	L2	True	250.00	251.95	100.8
7	KP83	L3	True	500.00	546.62	109.3
8	KP84	L4	True	1000.00	1072.27	107.2
9	KP85	L5	True	2500.00	2570.19	102.8
10	KP86	L6	True	10000.00	10431.42	104.3
11	KP87	L7	True	20000.00	19399.00	97.0



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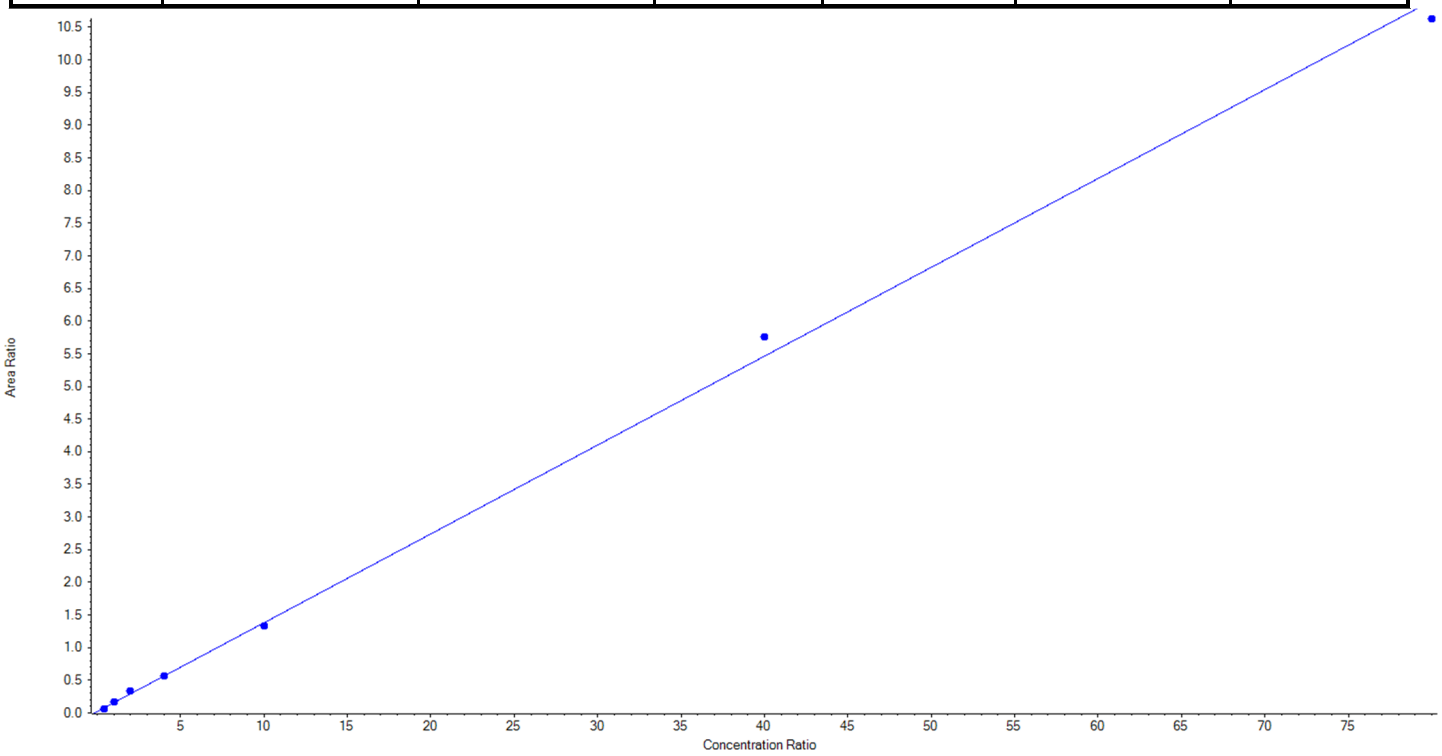
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFDoA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	613.0 / 319.0	**Result Table**	19-0746A
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.13608 x + 0.02010 (r = 0.99904) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	81.75	81.8
6	KP82	L2	True	250.00	261.98	104.8
7	KP83	L3	True	500.00	573.88	114.8
8	KP84	L4	True	1000.00	996.29	99.6
9	KP85	L5	True	2500.00	2404.76	96.2
10	KP86	L6	True	10000.00	10541.08	105.4
11	KP87	L7	True	20000.00	19490.26	97.5



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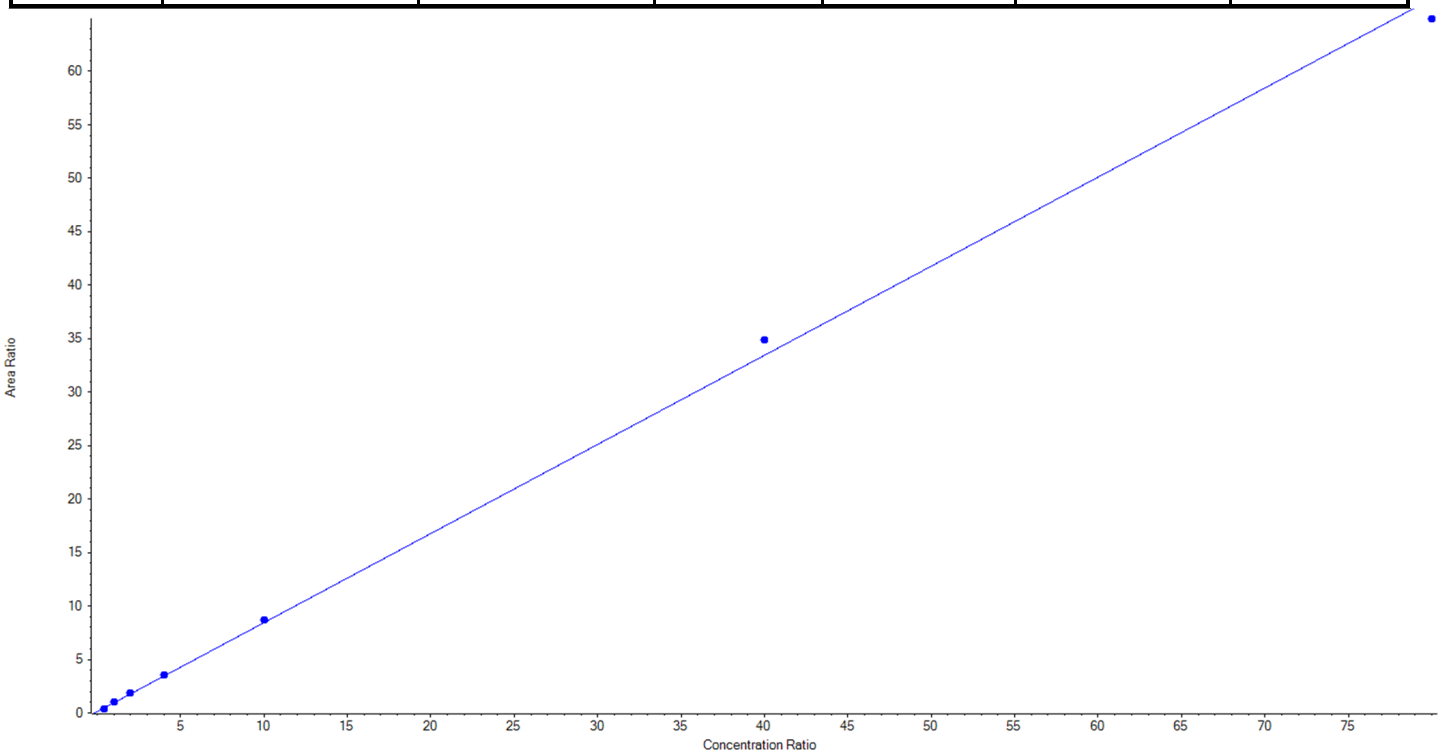
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTrDA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	663.0 / 619.0	**Result Table**	19-0746A
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.83335 x + 0.11056 (r = 0.99930) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	80.51	80.5
6	KP82	L2	True	250.00	264.59	105.8
7	KP83	L3	True	500.00	533.53	106.7
8	KP84	L4	True	1000.00	1026.64	102.7
9	KP85	L5	True	2500.00	2567.51	102.7
10	KP86	L6	True	10000.00	10438.87	104.4
11	KP87	L7	True	20000.00	19438.34	97.2



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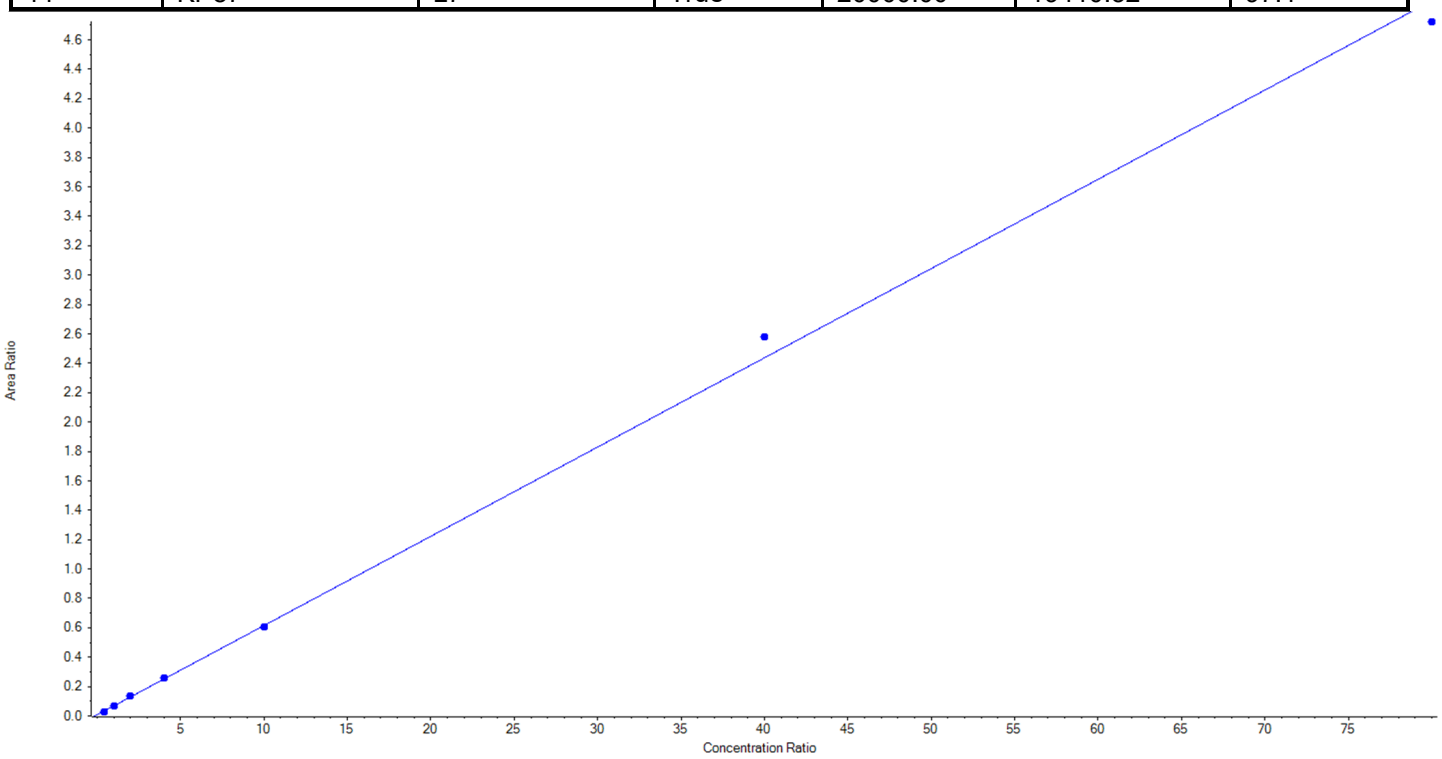
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTrDA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	663.0 / 169.0	**Result Table**	19-0746A
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.06073 x + 0.00784 (r = 0.99909) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	86.86	86.9
6	KP82	L2	True	250.00	257.39	103.0
7	KP83	L3	True	500.00	531.71	106.3
8	KP84	L4	True	1000.00	1029.77	103.0
9	KP85	L5	True	2500.00	2449.19	98.0
10	KP86	L6	True	10000.00	10584.76	105.9
11	KP87	L7	True	20000.00	19410.32	97.1



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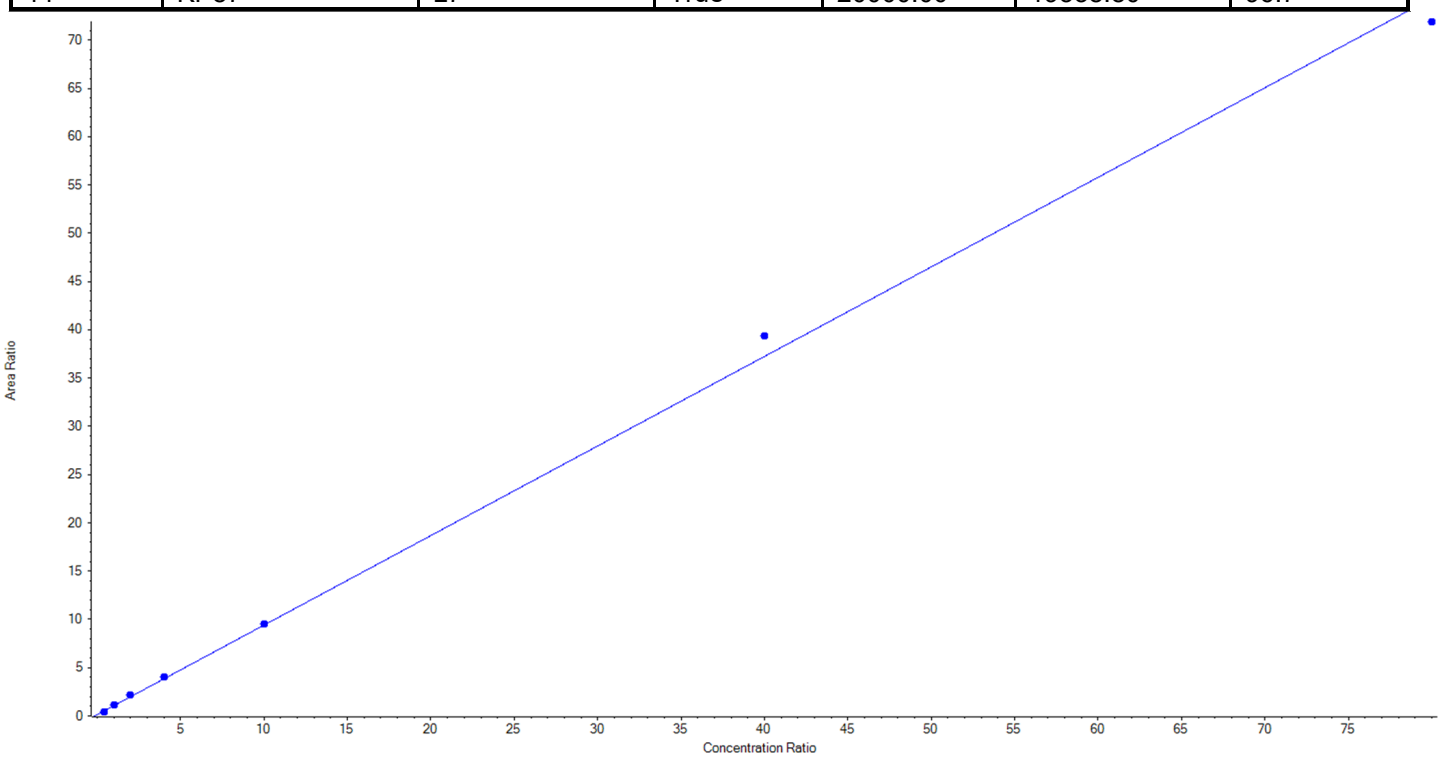
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTeDA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	713.0 / 669.0	**Result Table**	19-0746A
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.92769 x + 0.12923 (r = 0.99899) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	78.84	78.8
6	KP82	L2	True	250.00	264.45	105.8
7	KP83	L3	True	500.00	539.85	108.0
8	KP84	L4	True	1000.00	1040.04	104.0
9	KP85	L5	True	2500.00	2527.91	101.1
10	KP86	L6	True	10000.00	10560.12	105.6
11	KP87	L7	True	20000.00	19338.80	96.7



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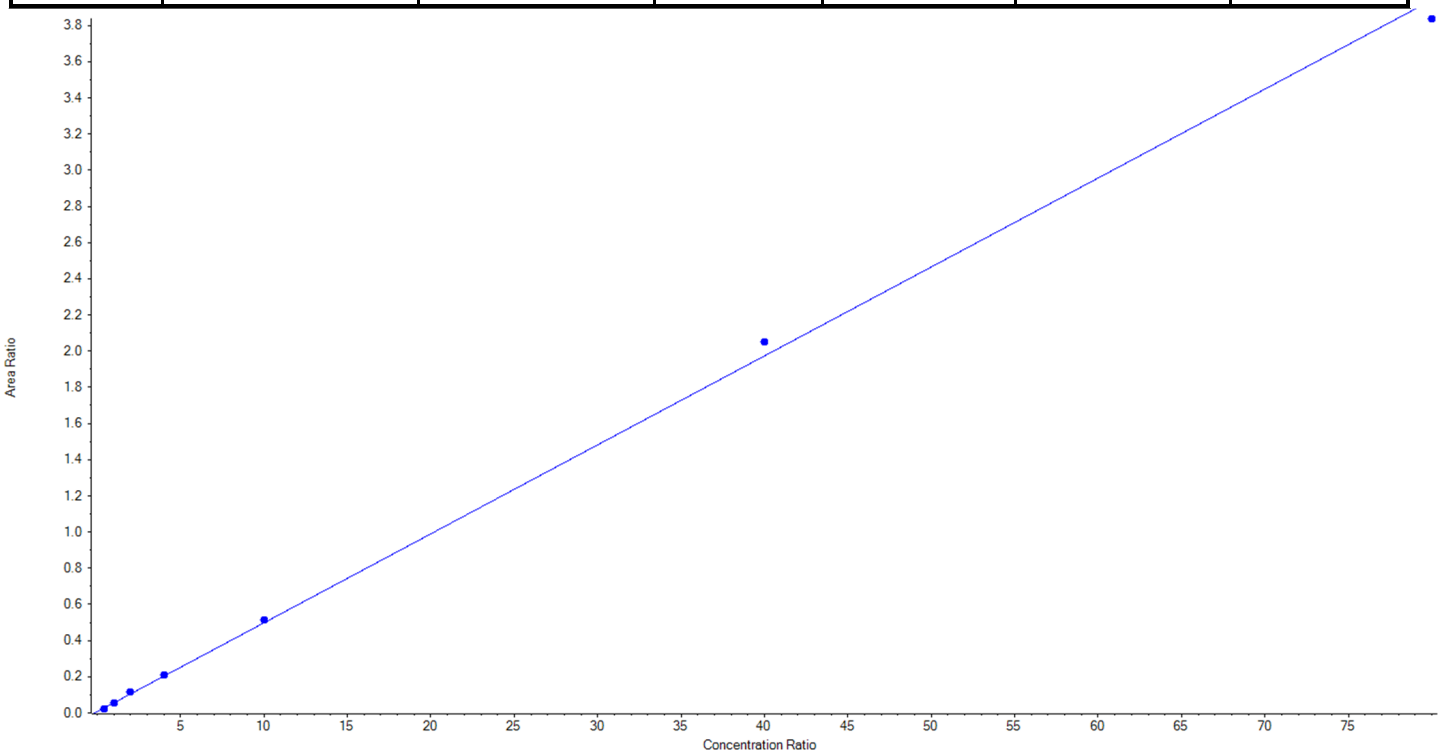
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	PFTeDA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	713.0 / 169.0	**Result Table**	19-0746A
Internal Standard	13C2-PFTeDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.04917 x + 0.00667 (r = 0.99936) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	84.97	85.0
6	KP82	L2	True	250.00	242.67	97.1
7	KP83	L3	True	500.00	551.87	110.4
8	KP84	L4	True	1000.00	1031.31	103.1
9	KP85	L5	True	2500.00	2581.17	103.3
10	KP86	L6	True	10000.00	10385.13	103.9
11	KP87	L7	True	20000.00	19472.89	97.4



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Calibration Summary Report

Created with Analyst Reporter
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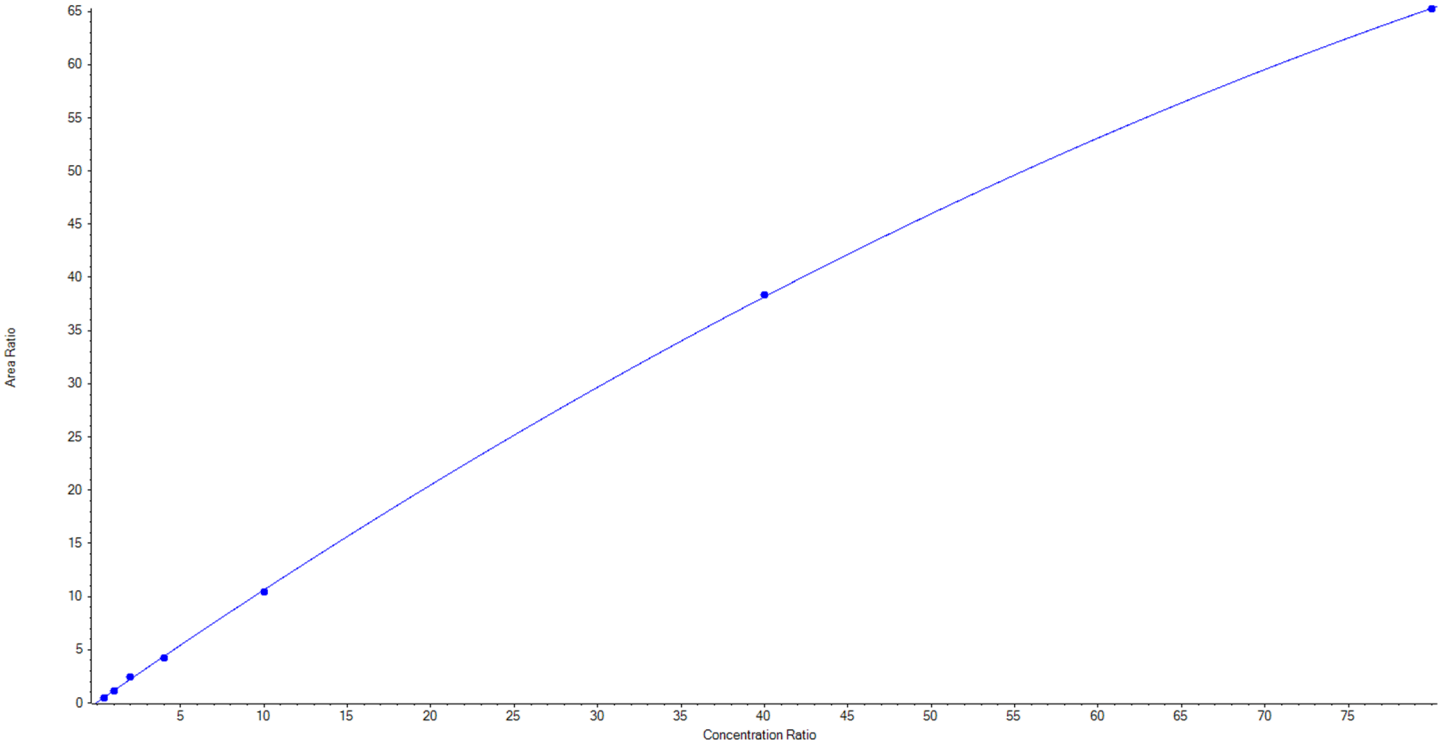
Analyte Name	NMeFOSAA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	570.0 / 419.0	**Result Table**	19-0746A
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -0.00343 x^2 + 1.08979 x + 0.07128 (r = 0.99982) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	93.71	93.7
6	KP82	L2	True	250.00	249.96	100.0
7	KP83	L3	True	500.00	552.50	110.5
8	KP84	L4	True	1000.00	971.31	97.1
9	KP85	L5	True	2500.00	2459.05	98.4
10	KP86	L6	True	10000.00	10042.69	100.4
11	KP87	L7	True	20000.00	19977.80	99.9



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Calibration Summary Report

Created with Analyst Reporter
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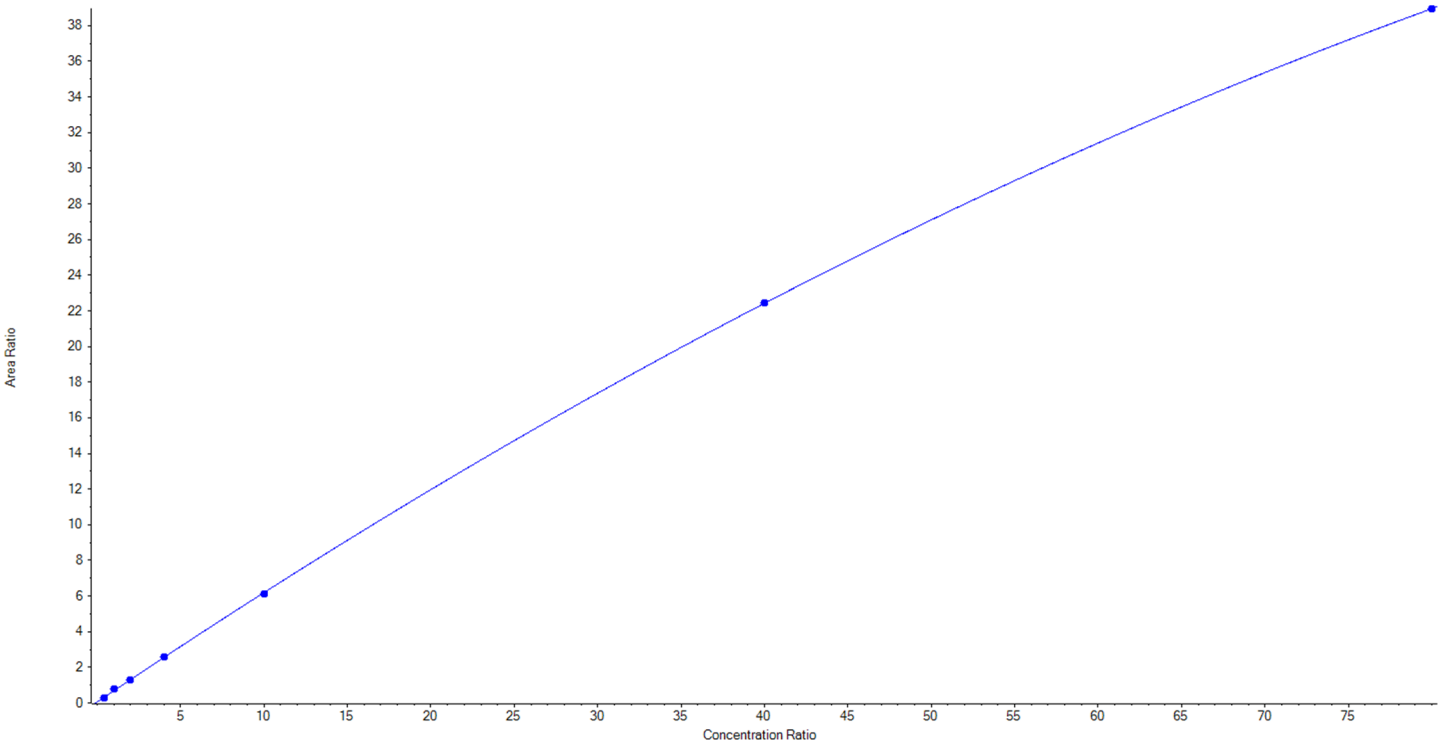
Analyte Name	NMeFOSAA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	570.0 / 512.0	**Result Table**	19-0746A
Internal Standard	d3-MeFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -0.00183 x^2 + 0.63231 x + 0.05163 (r = 0.99987) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	88.61	88.6
6	KP82	L2	True	250.00	281.74	112.7
7	KP83	L3	True	500.00	498.48	99.7
8	KP84	L4	True	1000.00	1001.29	100.1
9	KP85	L5	True	2500.00	2468.40	98.7
10	KP86	L6	True	10000.00	10016.88	100.2
11	KP87	L7	True	20000.00	19994.18	100.0



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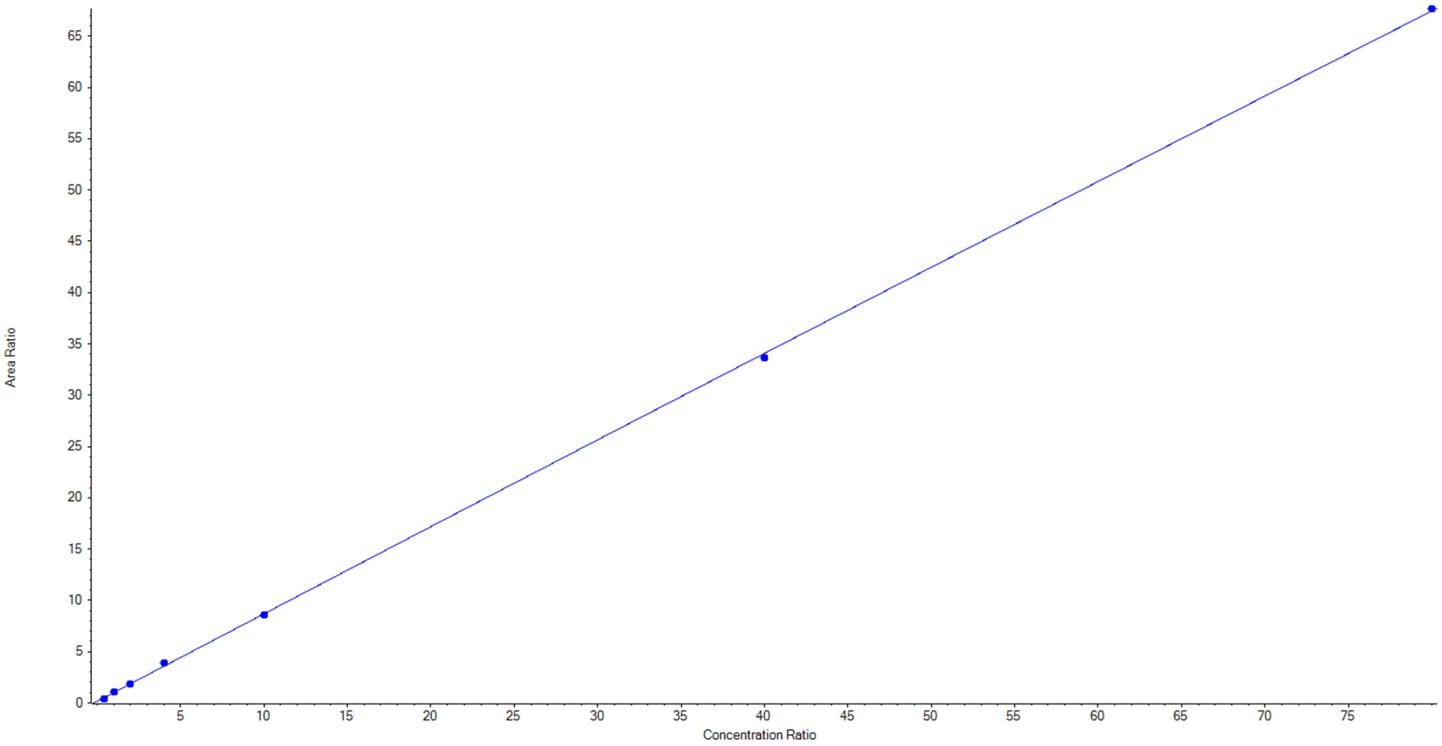
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NEtFOSAA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	584.0 / 419.0	**Result Table**	19-0746A
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -1.68251e-4 x^2 + 0.85459 x + 0.15924 (r = 0.99973) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	81.36	81.4
6	KP82	L2	True	250.00	279.36	111.8
7	KP83	L3	True	500.00	504.27	100.9
8	KP84	L4	True	1000.00	1085.68	108.6
9	KP85	L5	True	2500.00	2459.70	98.4
10	KP86	L6	True	10000.00	9876.58	98.8
11	KP87	L7	True	20000.00	20063.10	100.3



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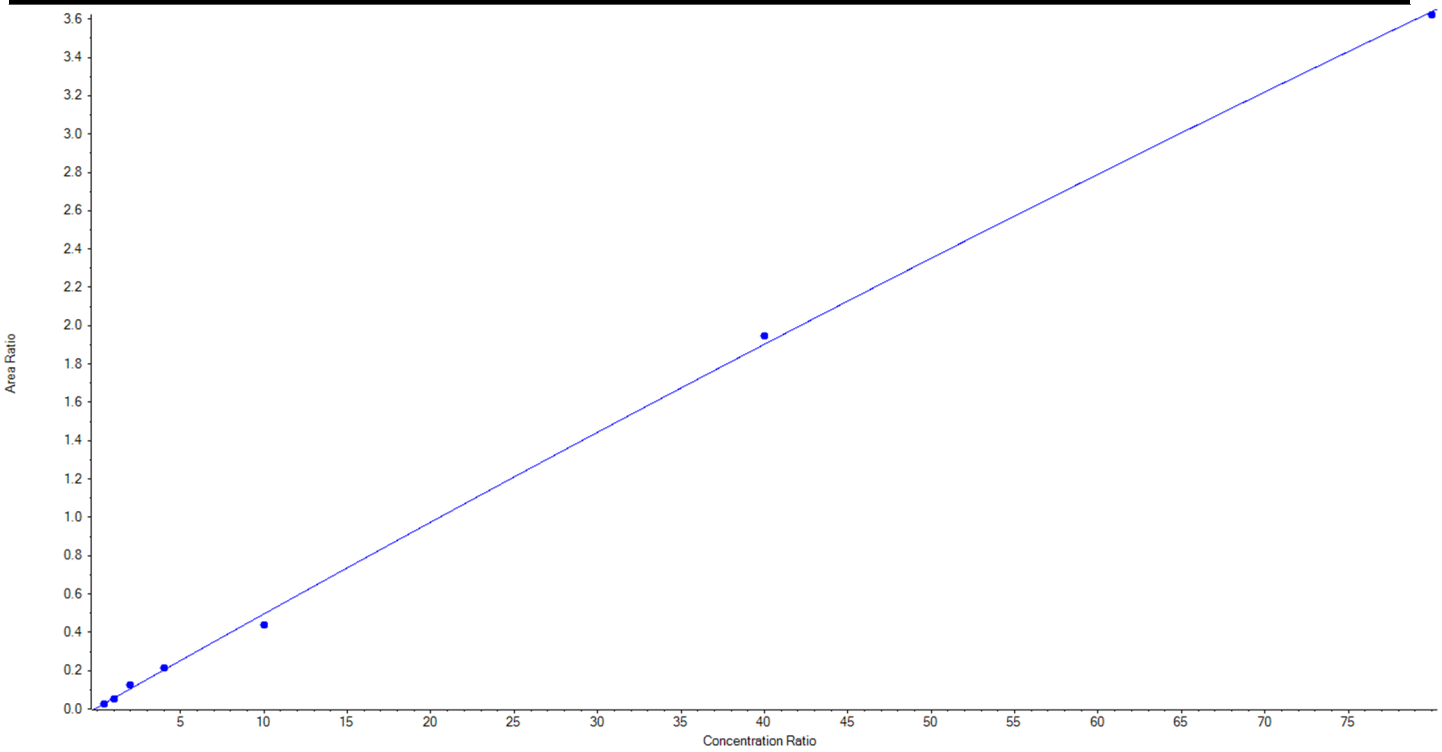
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	NEtFOSAA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	584.0 / 483.0	**Result Table**	19-0746A
Internal Standard	d5-EtFOSAA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -5.02441e-5 x^2 + 0.04942 x + 0.00668 (r = 0.99881) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	87.34	87.3
6	KP82	L2	True	250.00	238.09	95.2
7	KP83	L3	True	500.00	603.07	120.6
8	KP84	L4	True	1000.00	1065.55	106.6
9	KP85	L5	True	2500.00	2207.72	88.3
10	KP86	L6	True	10000.00	10247.11	102.5
11	KP87	L7	True	20000.00	19900.75	99.5



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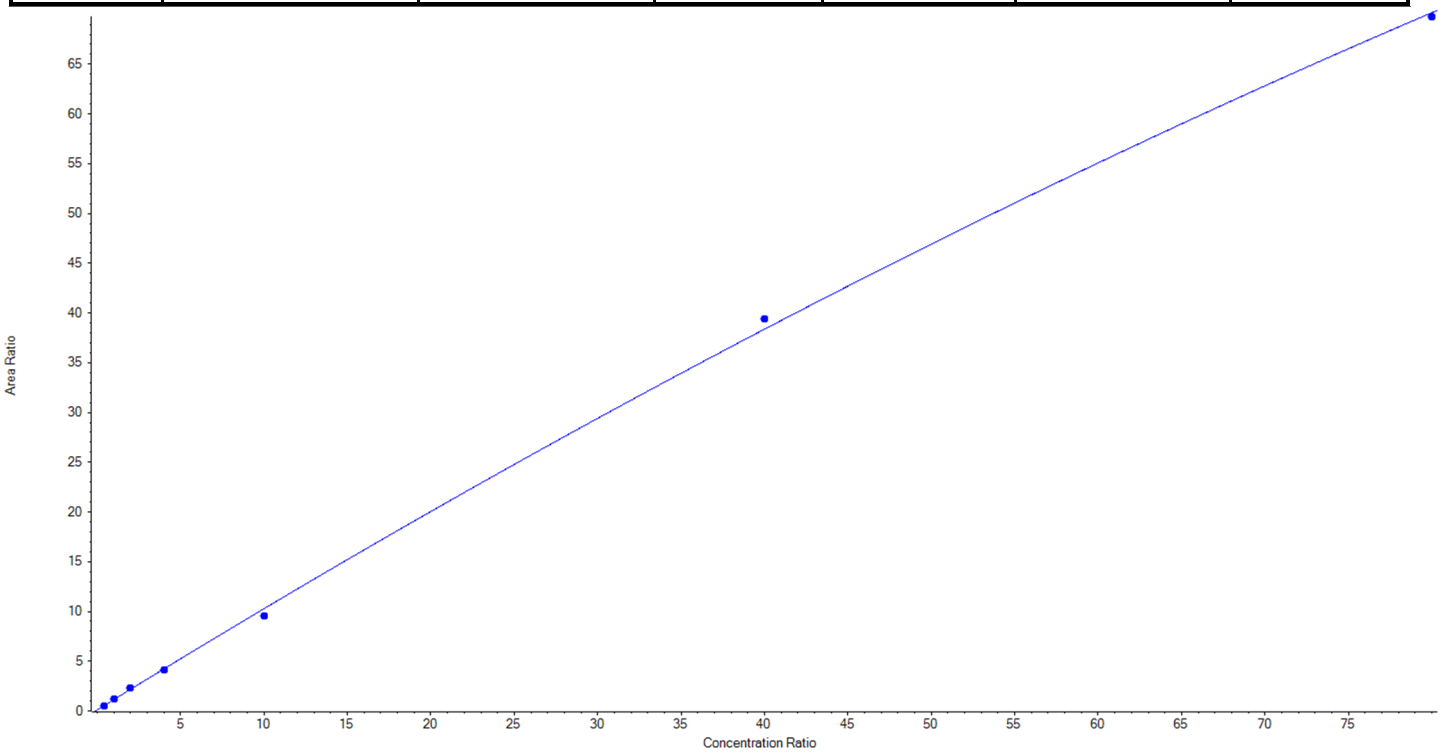
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	HFPO-DA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	285.0 / 169.0	**Result Table**	19-0746A
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -0.00202 x^2 + 1.03713 x + 0.10745 (r = 0.99949) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	89.64	89.6
6	KP82	L2	True	250.00	276.46	110.6
7	KP83	L3	True	500.00	532.29	106.5
8	KP84	L4	True	1000.00	985.08	98.5
9	KP85	L5	True	2500.00	2316.28	92.7
10	KP86	L6	True	10000.00	10289.04	102.9
11	KP87	L7	True	20000.00	19855.16	99.3



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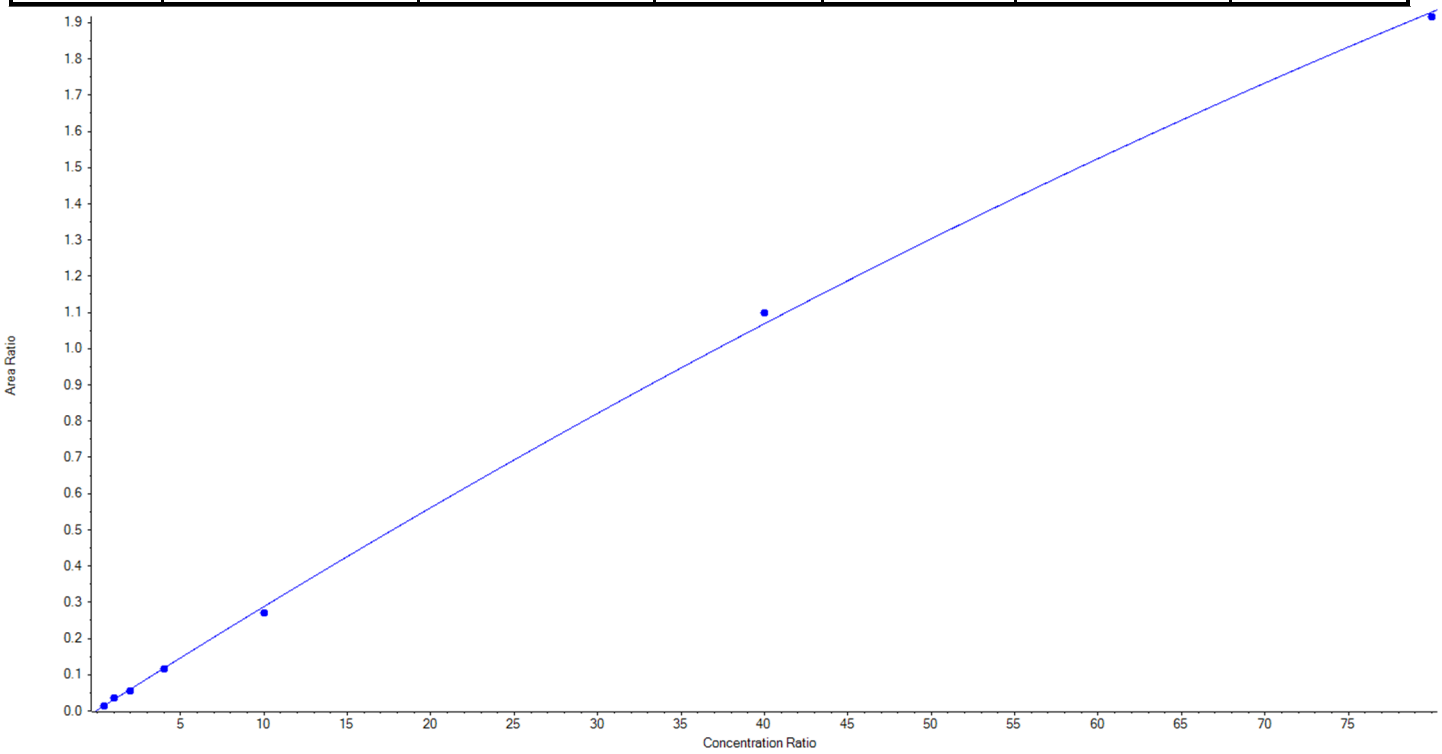
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	HFPO-DA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	285.0 / 118.8	**Result Table**	19-0746A
Internal Standard	13C3-HFPO-DA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = -6.46587e-5 x^2 + 0.02926 x + 0.00189 (r = 0.99942) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	92.45	92.5
6	KP82	L2	True	250.00	296.68	118.7
7	KP83	L3	True	500.00	468.72	93.7
8	KP84	L4	True	1000.00	989.64	99.0
9	KP85	L5	True	2500.00	2346.77	93.9
10	KP86	L6	True	10000.00	10316.56	103.2
11	KP87	L7	True	20000.00	19829.03	99.2



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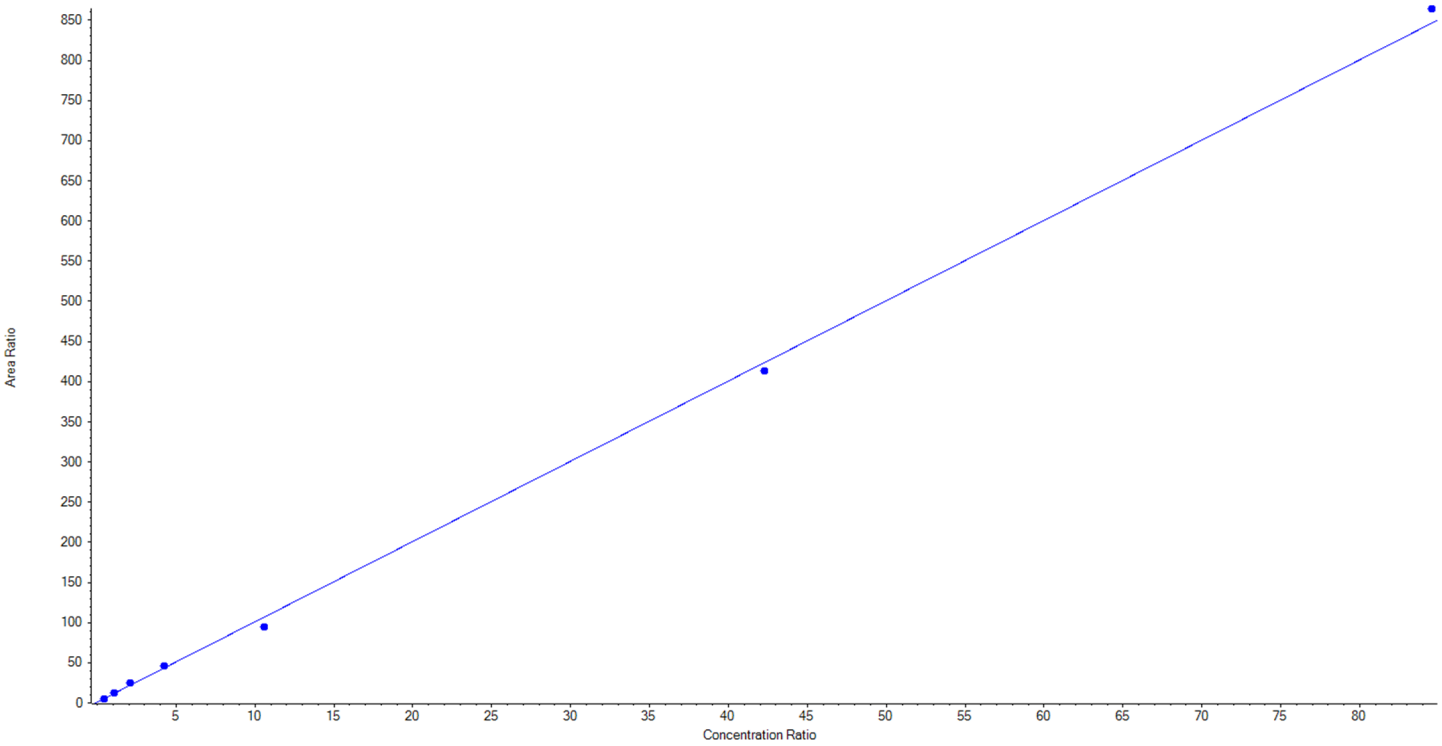
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	ADONA_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	377.0 / 251.0	**Result Table**	19-0746A
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 9.99612 x + 1.05956 (r = 0.99905) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	100.00	89.87	89.9
6	KP82	L2	True	250.00	262.26	104.9
7	KP83	L3	True	500.00	556.75	111.4
8	KP84	L4	True	1000.00	1058.72	105.9
9	KP85	L5	True	2500.00	2209.75	88.4
10	KP86	L6	True	10000.00	9750.93	97.5
11	KP87	L7	True	20000.00	20421.73	102.1



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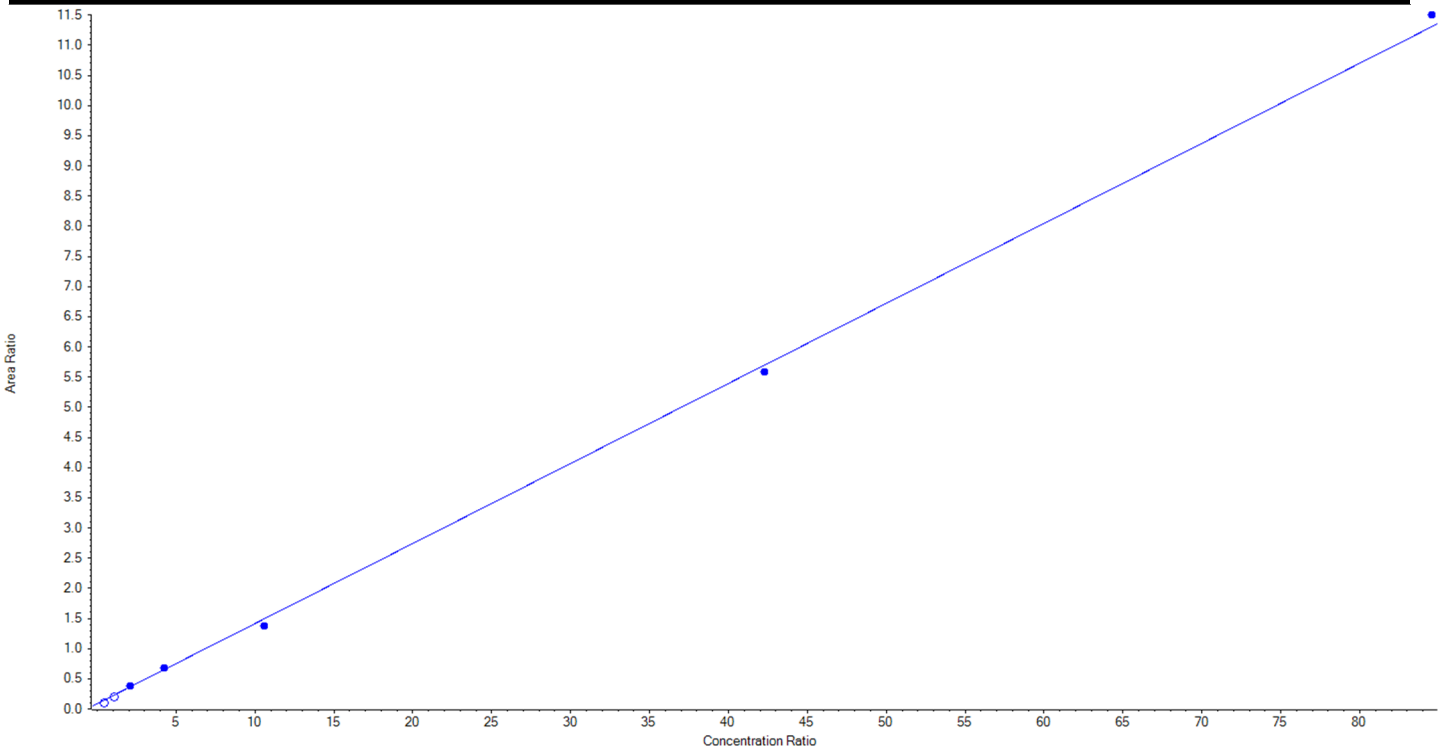
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	ADONA_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	377.0 / 85.0	**Result Table**	19-0746A
Internal Standard	13C3-PFHxS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.13265 x + 0.08870 (r = 0.99937) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	False	100.00	23.57	23.6
6	KP82	L2	False	250.00	189.78	75.9
7	KP83	L3	True	500.00	515.13	103.0
8	KP84	L4	True	1000.00	1060.54	106.1
9	KP85	L5	True	2500.00	2281.03	91.2
10	KP86	L6	True	10000.00	9792.55	97.9
11	KP87	L7	True	20000.00	20350.75	101.8



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Calibration Summary Report

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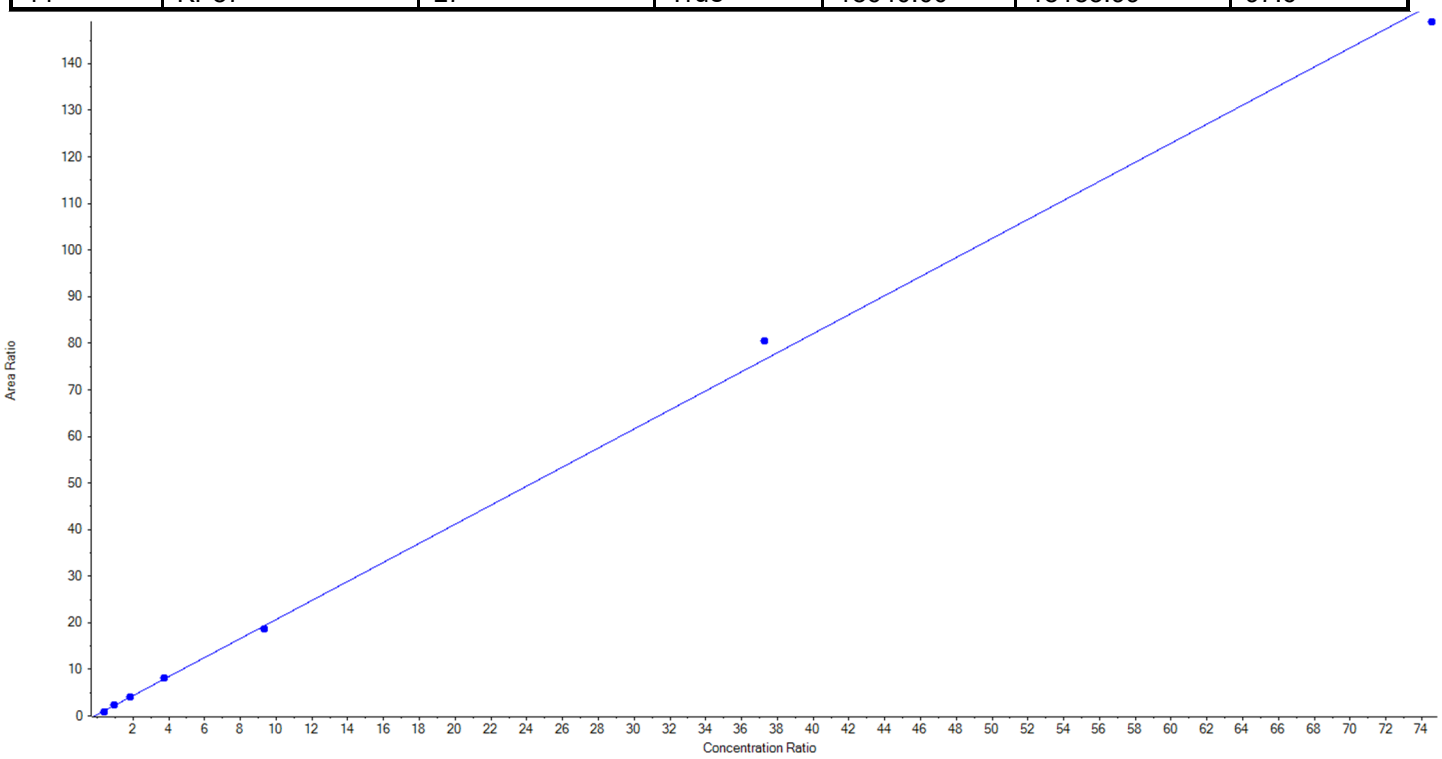
Analyte Name	9Cl-PF3ONS_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	531.0 / 351.0	**Result Table**	19-0746A
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 2.04481 x + 0.25727 (r = 0.99924) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	93.20	82.22	88.2
6	KP82	L2	True	233.00	249.70	107.2
7	KP83	L3	True	466.00	468.37	100.5
8	KP84	L4	True	932.00	978.68	105.0
9	KP85	L5	True	2330.00	2244.33	96.3
10	KP86	L6	True	9320.00	9806.91	105.2
11	KP87	L7	True	18640.00	18183.99	97.6



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Calibration Summary Report

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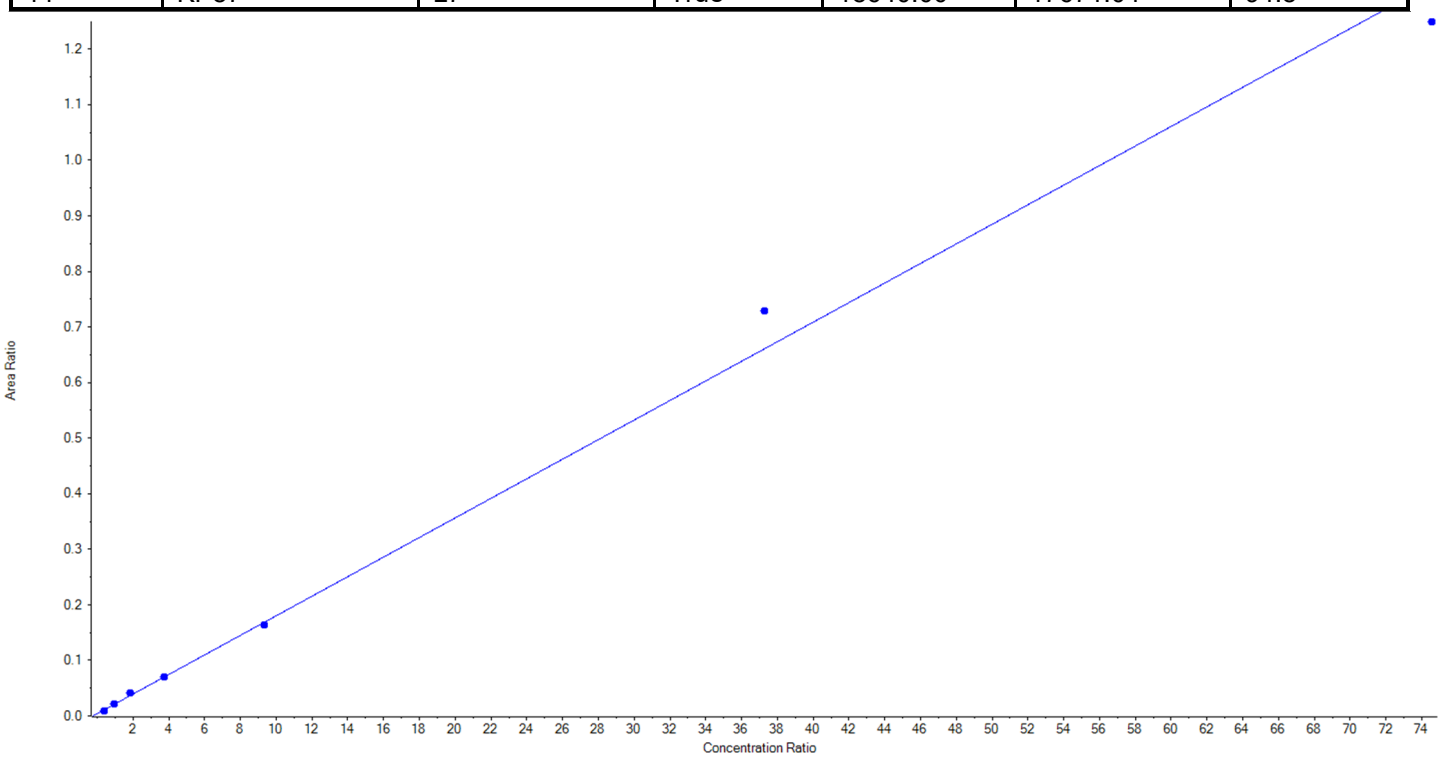
Printed: 04/09/2019 2:23:03 PM

Analyte Name	9Cl-PF3ONS_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	531.0 / 83.0	**Result Table**	19-0746A
Internal Standard	13C9-PFNA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.01761 x + 0.00408 (r = 0.99711) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	93.20	68.08	73.1
6	KP82	L2	True	233.00	252.99	108.6
7	KP83	L3	True	466.00	538.53	115.6
8	KP84	L4	True	932.00	935.25	100.4
9	KP85	L5	True	2330.00	2268.40	97.4
10	KP86	L6	True	9320.00	10279.91	110.3
11	KP87	L7	True	18640.00	17671.04	94.8



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Calibration Summary Report

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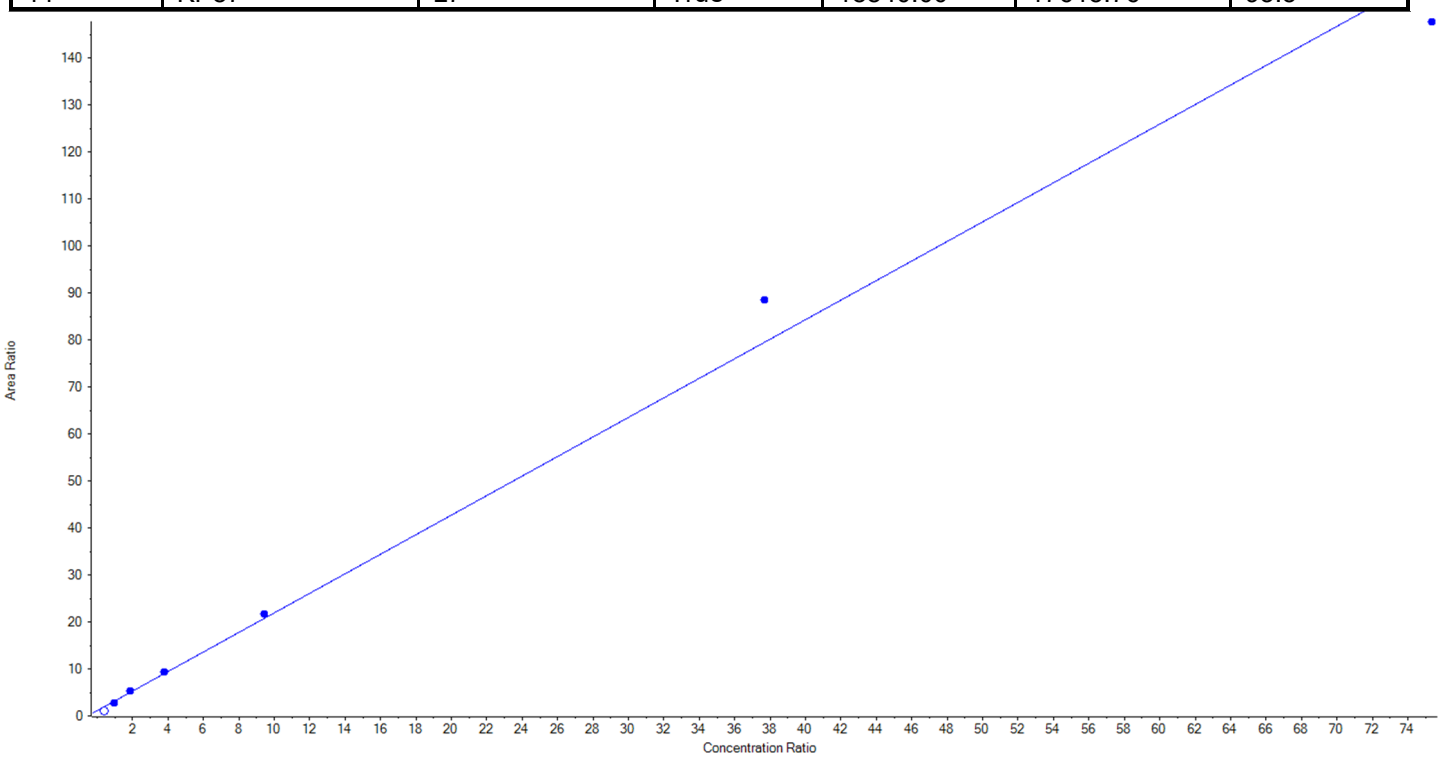
Printed: 04/09/2019 2:23:03 PM

Analyte Name	11Cl-pf3OUdS_1	**Data File**	AC_09032019_5-369.wiff
MRM Transition	631.0 / 451.0	**Result Table**	19-0746A
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 2.08074 x + 1.12844 (r = 0.99602) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	False	94.20	< 0	N/A
6	KP82	L2	True	235.50	190.53	80.9
7	KP83	L3	True	471.00	494.16	104.9
8	KP84	L4	True	942.00	978.67	103.9
9	KP85	L5	True	2355.00	2478.95	105.3
10	KP86	L6	True	9420.00	10505.44	111.5
11	KP87	L7	True	18840.00	17615.76	93.5



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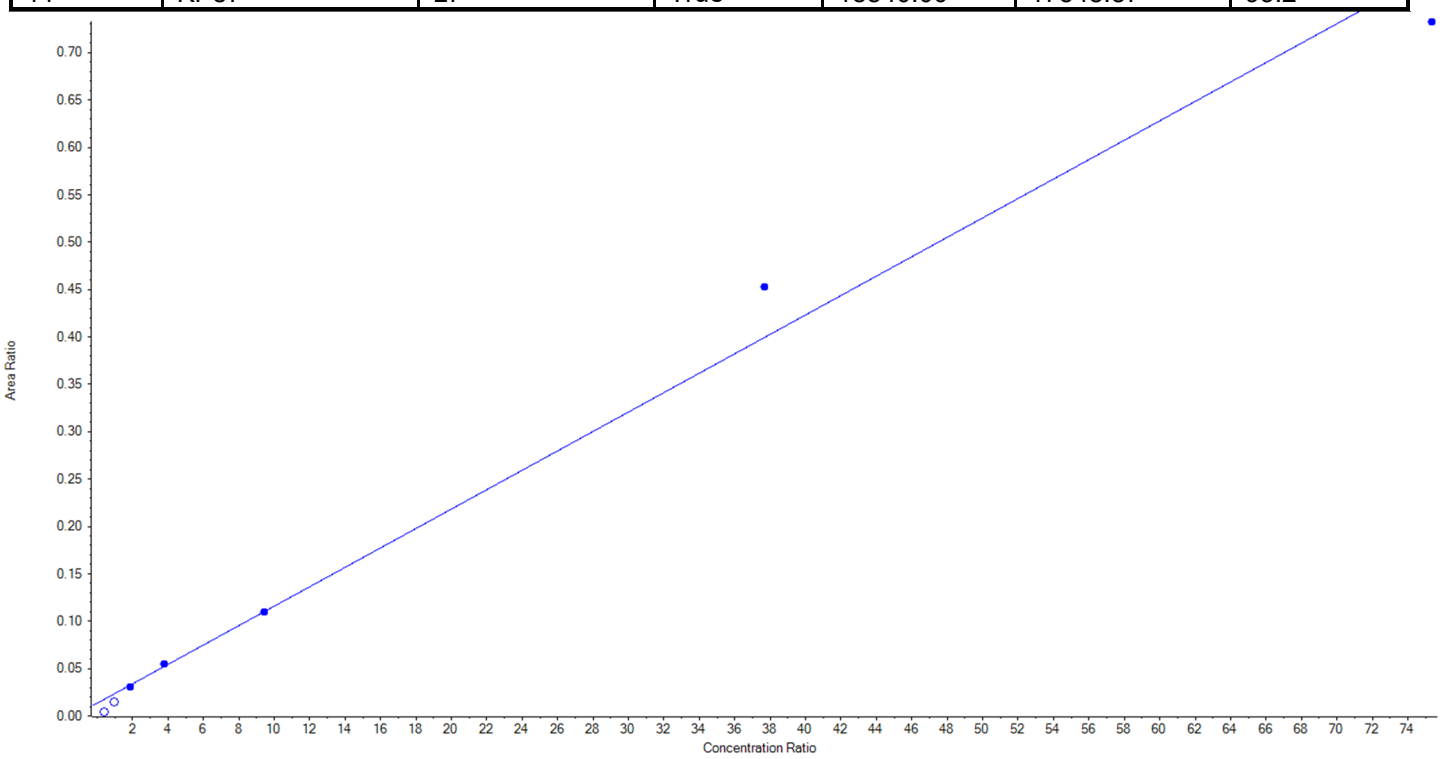
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 2:23:03 PM

Analyte Name	11Cl-pf3OUdS_2	**Data File**	AC_09032019_5-369.wiff
MRM Transition	631.0 / 83.0	**Result Table**	19-0746A
Internal Standard	13C2-PFDoA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.01024 x + 0.01340 (r = 0.99451) (weighting: 1 / x)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	False	94.20	< 0	N/A
6	KP82	L2	False	235.50	42.70	18.1
7	KP83	L3	True	471.00	409.28	86.9
8	KP84	L4	True	942.00	1005.17	106.7
9	KP85	L5	True	2355.00	2341.21	99.4
10	KP86	L6	True	9420.00	10723.48	113.8
11	KP87	L7	True	18840.00	17548.87	93.2



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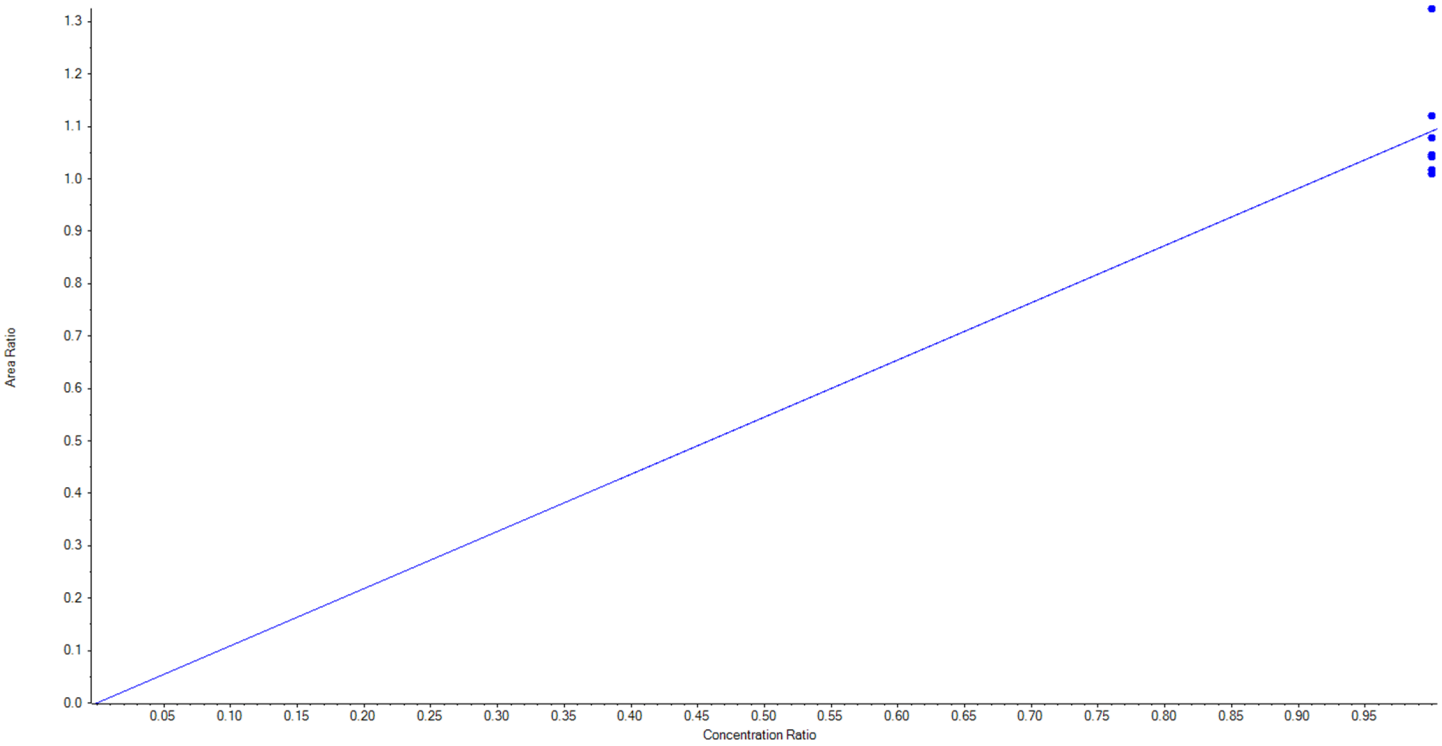
Calibration Summary Report

Analyte Name	13C2-PFDoA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	615.0 / 570.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.09110 x (std. dev. = 0.10952) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	238.74	95.5
6	KP82	L2	True	250.00	239.65	95.9
7	KP83	L3	True	250.00	231.17	92.5
8	KP84	L4	True	250.00	233.30	93.3
9	KP85	L5	True	250.00	256.49	102.6
10	KP86	L6	True	250.00	247.15	98.9
11	KP87	L7	True	250.00	303.49	121.4



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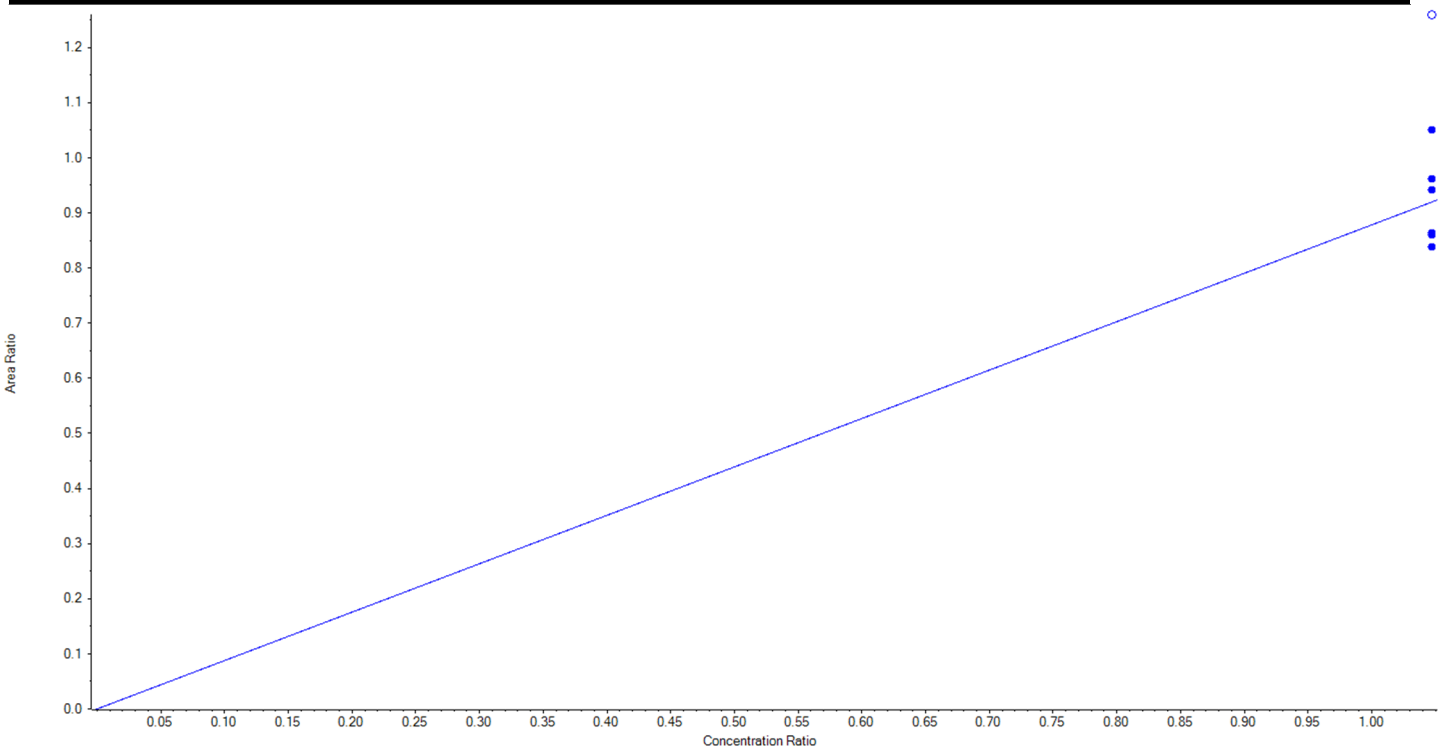
Calibration Summary Report

Analyte Name	d3-MeFOSAA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	573.0 / 419.0	**Result Table**	19-0746A_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.87827 x (std. dev. = 0.07742) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	233.71	93.5
6	KP82	L2	True	250.00	261.68	104.7
7	KP83	L3	True	250.00	256.17	102.5
8	KP84	L4	True	250.00	234.70	93.9
9	KP85	L5	True	250.00	228.06	91.2
10	KP86	L6	True	250.00	285.68	114.3
11	KP87	L7	False	250.00	342.34	136.9



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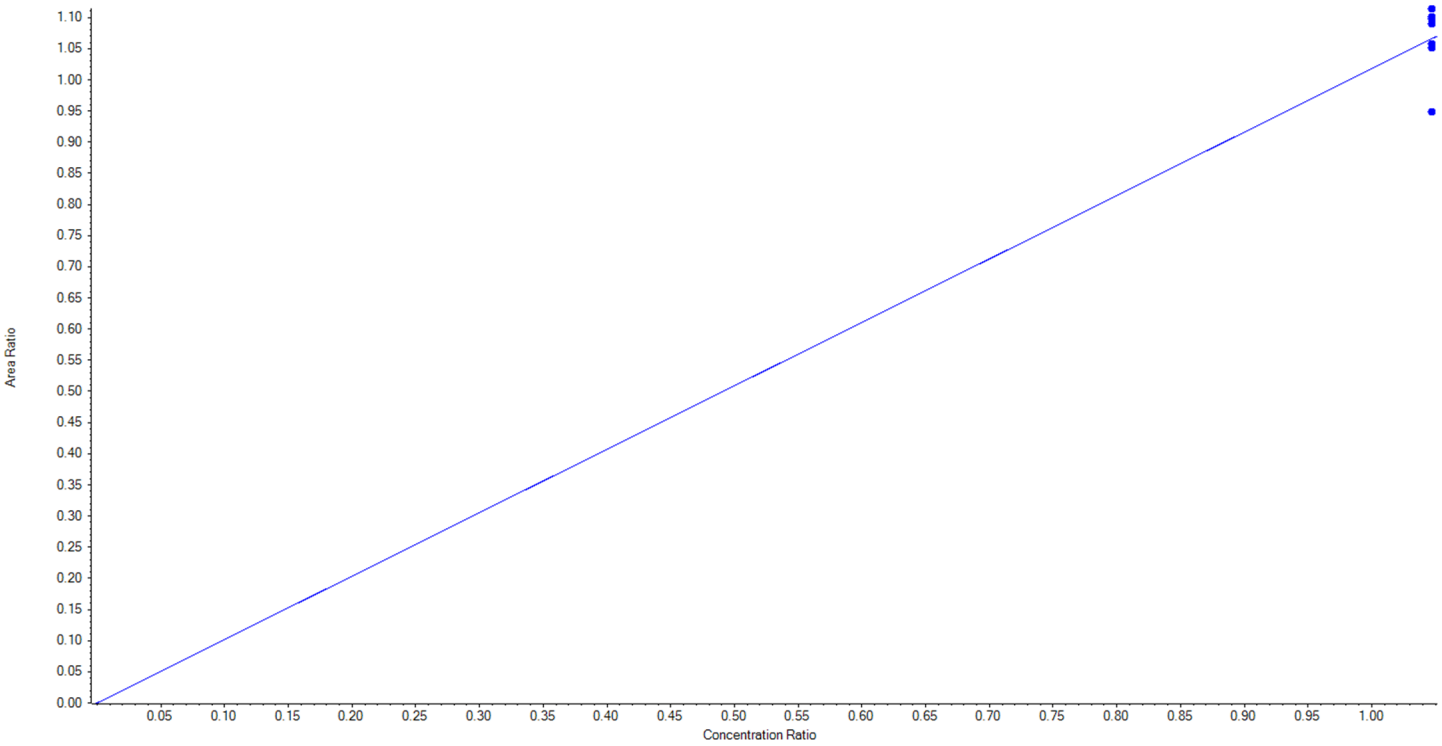
Calibration Summary Report

Analyte Name	d5-EtFOSAA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	589.0 / 419.0	**Result Table**	19-0746A_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.01787 x (std. dev. = 0.05400) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	255.61	102.2
6	KP82	L2	True	250.00	261.27	104.5
7	KP83	L3	True	250.00	257.36	102.9
8	KP84	L4	True	250.00	222.48	89.0
9	KP85	L5	True	250.00	248.15	99.3
10	KP86	L6	True	250.00	246.71	98.7
11	KP87	L7	True	250.00	258.42	103.4



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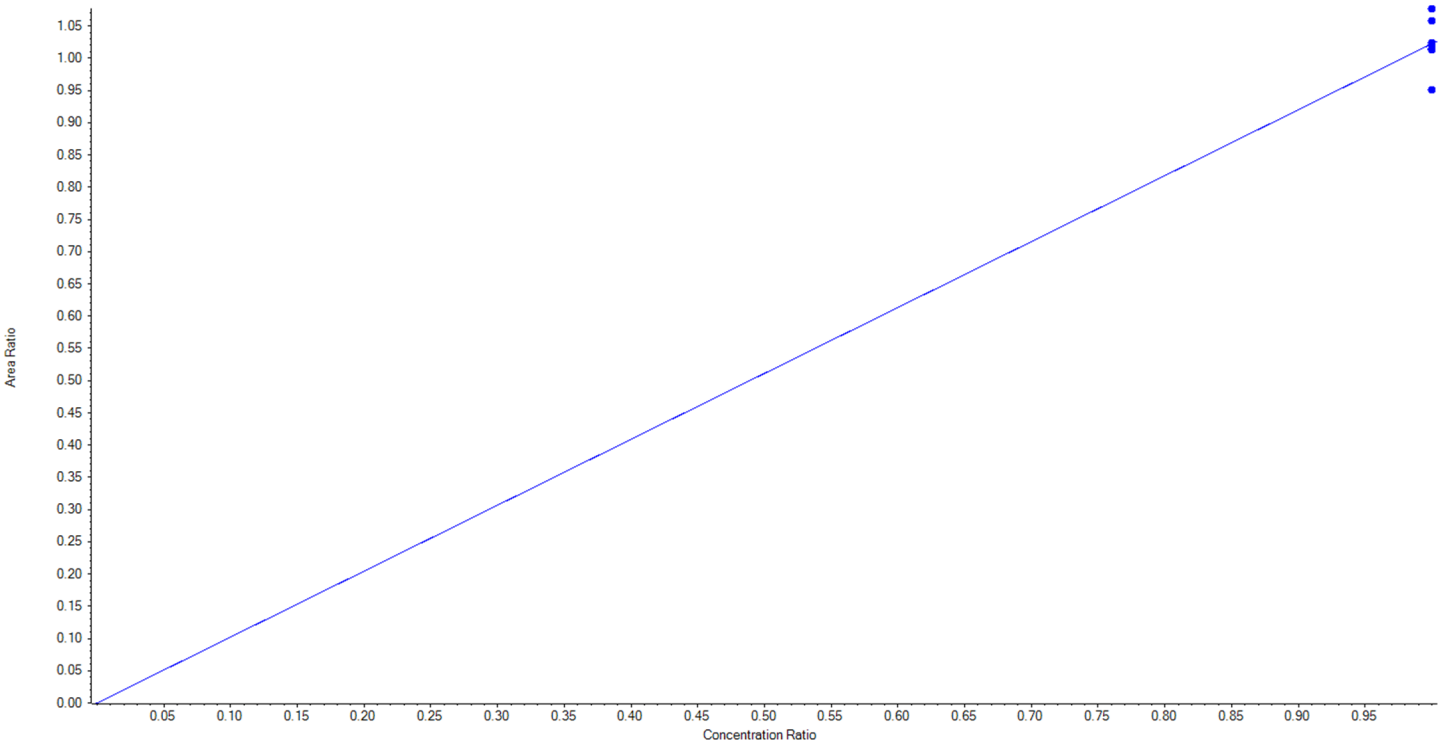
Calibration Summary Report

Analyte Name	13C5-PFHxA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	318.0 / 273.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.02230 x (std. dev. = 0.03992) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	250.33	100.1
6	KP82	L2	True	250.00	247.91	99.2
7	KP83	L3	True	250.00	263.27	105.3
8	KP84	L4	True	250.00	249.59	99.8
9	KP85	L5	True	250.00	258.87	103.6
10	KP86	L6	True	250.00	232.49	93.0
11	KP87	L7	True	250.00	247.53	99.0



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Calibration Summary Report

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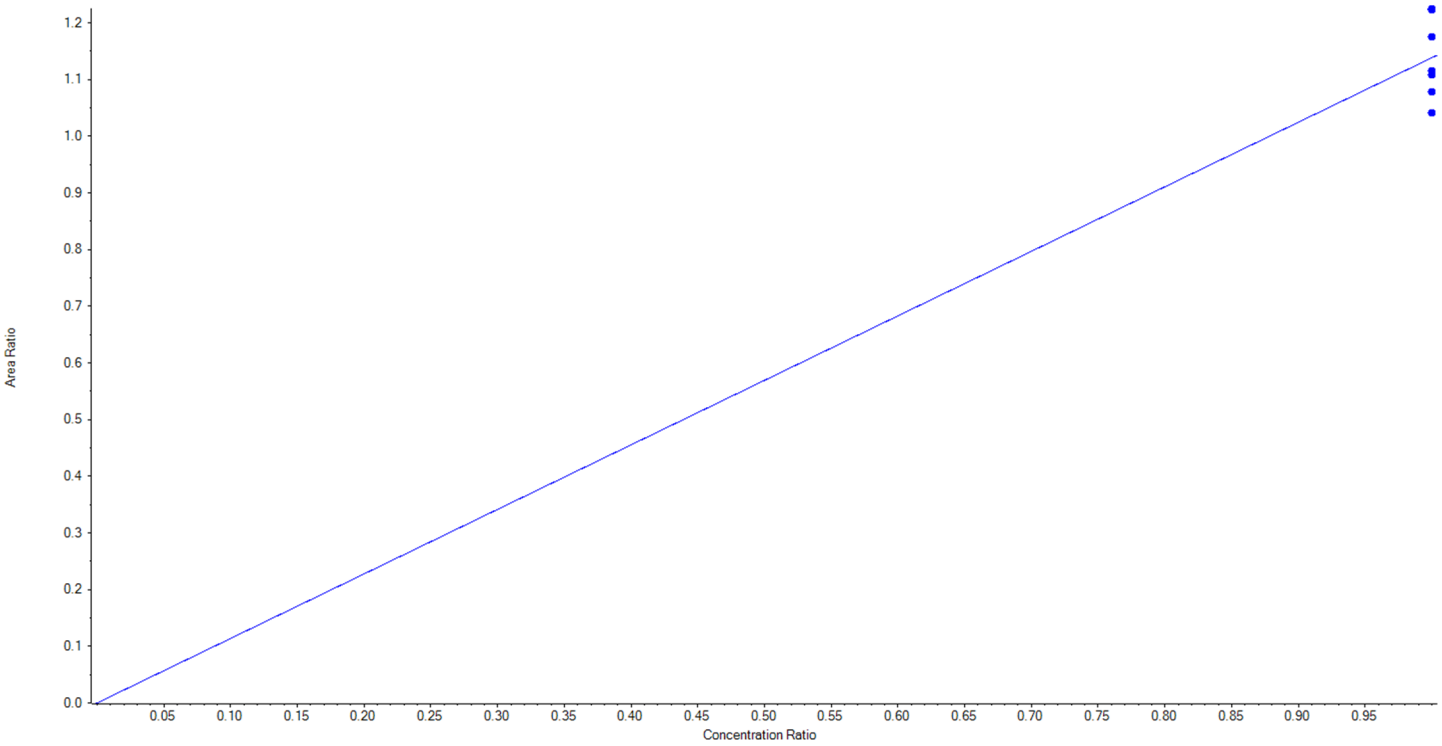
Analyte Name	13C4-PFHpA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	367.0 / 322.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.13862 x (std. dev. = 0.07104) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	268.95	107.6
6	KP82	L2	True	250.00	245.10	98.0
7	KP83	L3	True	250.00	258.26	103.3
8	KP84	L4	True	250.00	243.54	97.4
9	KP85	L5	True	250.00	268.51	107.4
10	KP86	L6	True	250.00	228.69	91.5
11	KP87	L7	True	250.00	236.96	94.8



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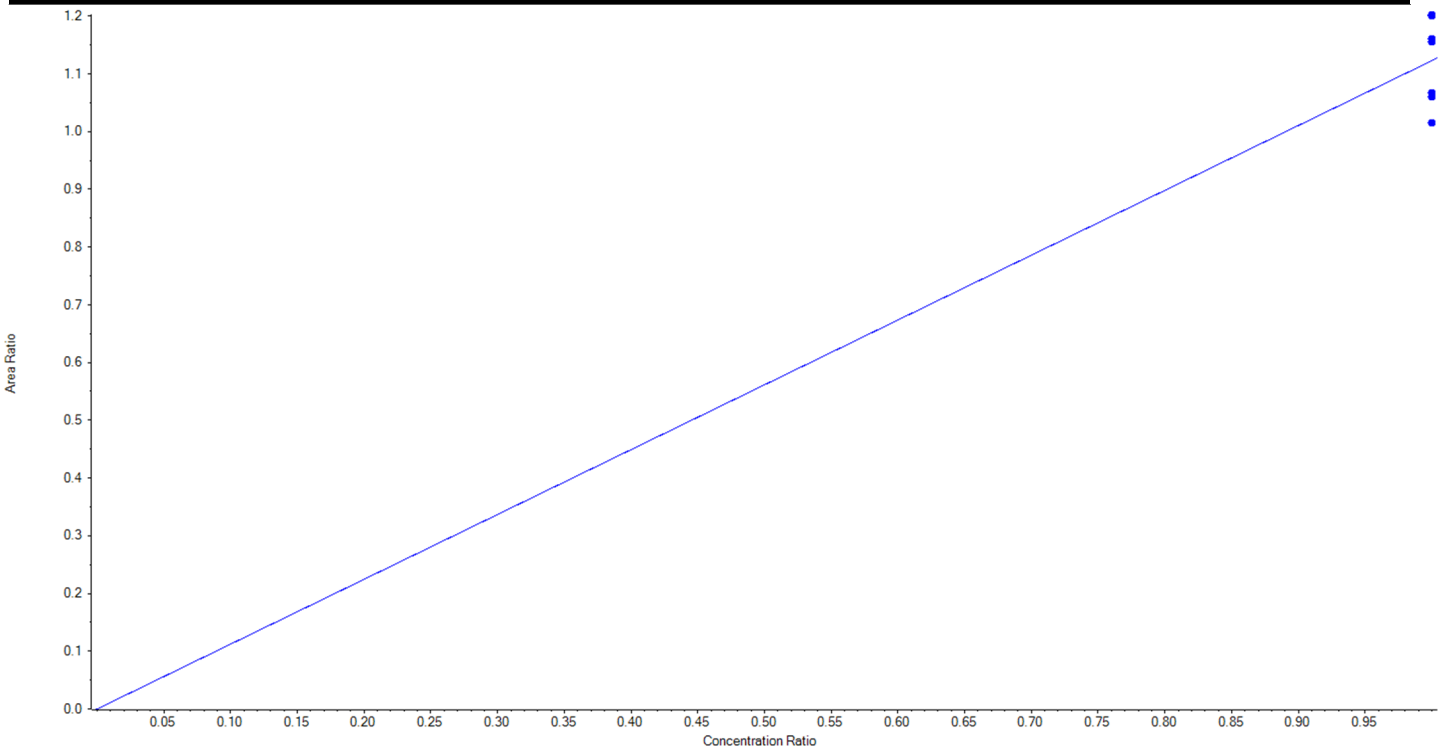
Calibration Summary Report

Analyte Name	13C8-PFOA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	421.0 / 376.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.12274 x (std. dev. = 0.07465) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	236.01	94.4
6	KP82	L2	True	250.00	257.19	102.9
7	KP83	L3	True	250.00	267.11	106.8
8	KP84	L4	True	250.00	258.51	103.4
9	KP85	L5	True	250.00	267.68	107.1
10	KP86	L6	True	250.00	225.96	90.4
11	KP87	L7	True	250.00	237.55	95.0



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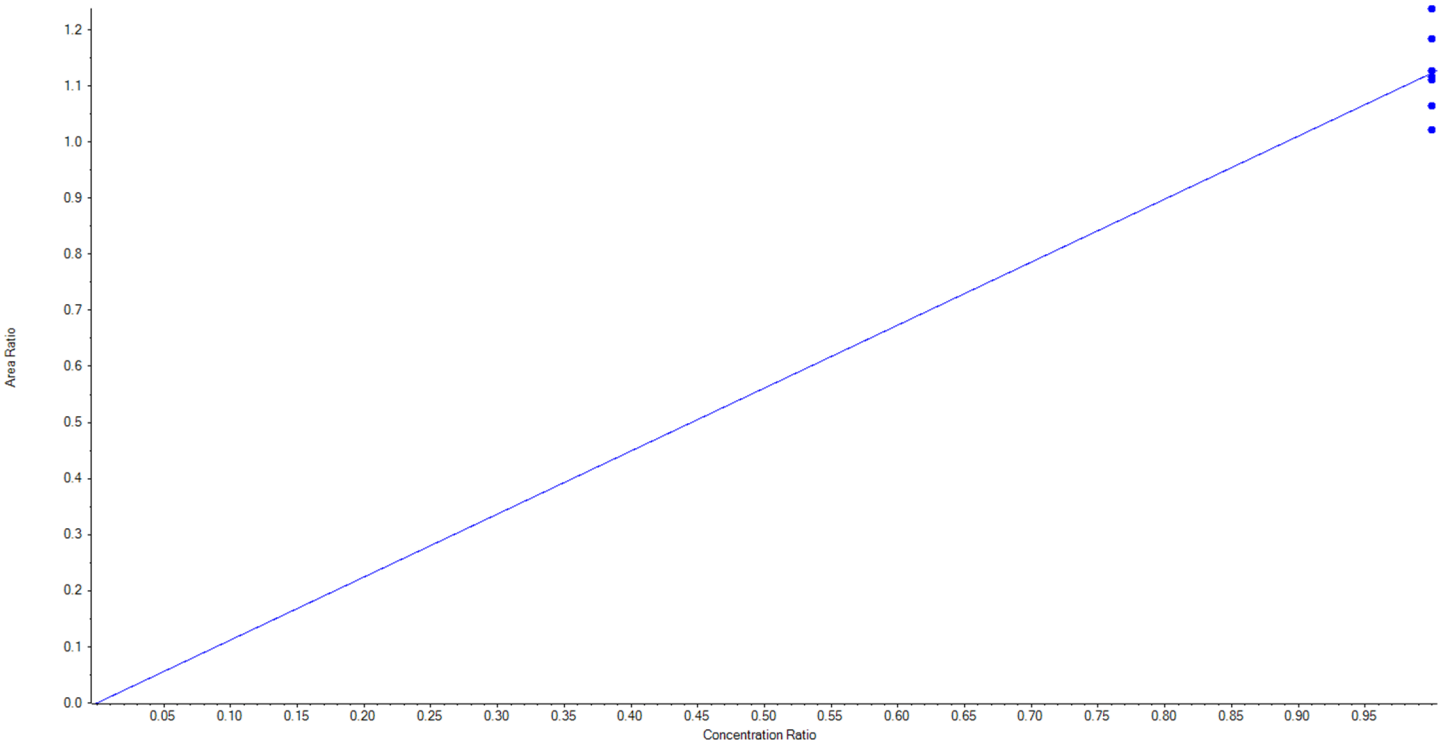
Calibration Summary Report

Analyte Name	13C9-PFNA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	472.0 / 427.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.12282 x (std. dev. = 0.07163) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	250.94	100.4
6	KP82	L2	True	250.00	248.48	99.4
7	KP83	L3	True	250.00	263.60	105.4
8	KP84	L4	True	250.00	247.13	98.9
9	KP85	L5	True	250.00	275.51	110.2
10	KP86	L6	True	250.00	236.84	94.7
11	KP87	L7	True	250.00	227.50	91.0



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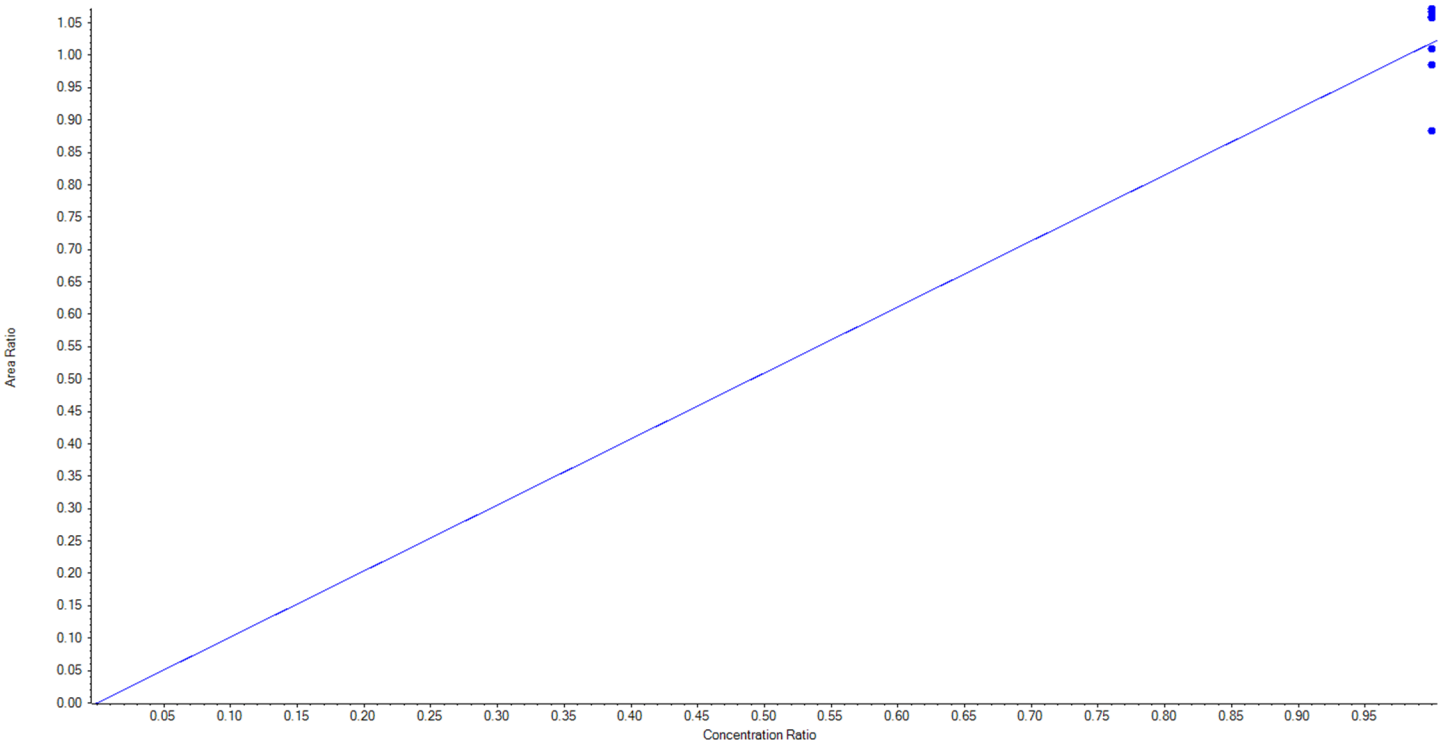
Calibration Summary Report

Analyte Name	13C6-PFDA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	519.0 / 474.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.01920 x (std. dev. = 0.06803) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	261.73	104.7
6	KP82	L2	True	250.00	259.48	103.8
7	KP83	L3	True	250.00	241.70	96.7
8	KP84	L4	True	250.00	262.89	105.2
9	KP85	L5	True	250.00	259.71	103.9
10	KP86	L6	True	250.00	216.70	86.7
11	KP87	L7	True	250.00	247.80	99.1



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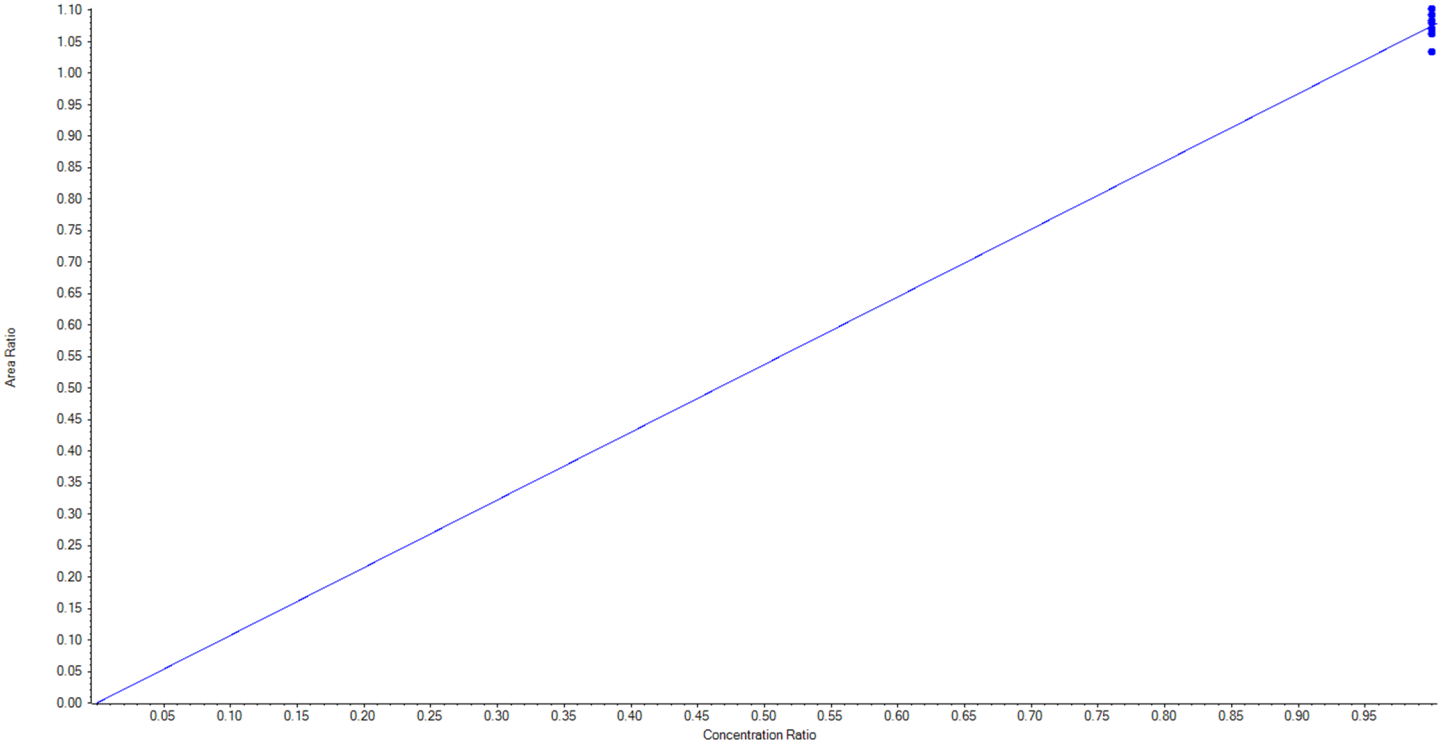
Calibration Summary Report

Analyte Name	13C7-PFUnA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	570.0 / 525.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.07513 x (std. dev. = 0.02236) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	251.76	100.7
6	KP82	L2	True	250.00	240.50	96.2
7	KP83	L3	True	250.00	247.07	98.8
8	KP84	L4	True	250.00	251.21	100.5
9	KP85	L5	True	250.00	256.32	102.5
10	KP86	L6	True	250.00	248.92	99.6
11	KP87	L7	True	250.00	254.21	101.7



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Calibration Summary Report

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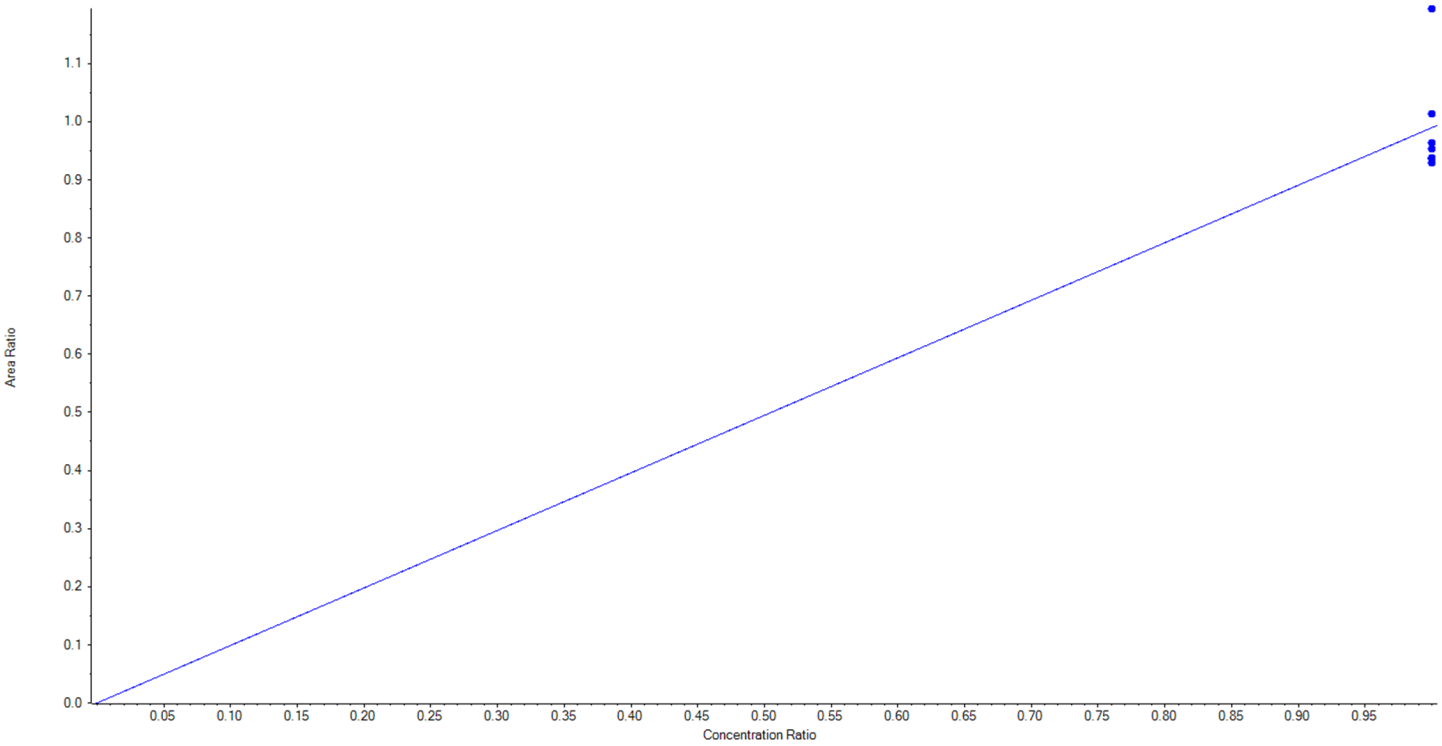
Analyte Name	13C2-PFTeDA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	715.0 / 670.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFDA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.98971 x (std. dev. = 0.09447) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	240.98	96.4
6	KP82	L2	True	250.00	236.48	94.6
7	KP83	L3	True	250.00	234.68	93.9
8	KP84	L4	True	250.00	236.99	94.8
9	KP85	L5	True	250.00	256.03	102.4
10	KP86	L6	True	250.00	243.20	97.3
11	KP87	L7	True	250.00	301.63	120.7



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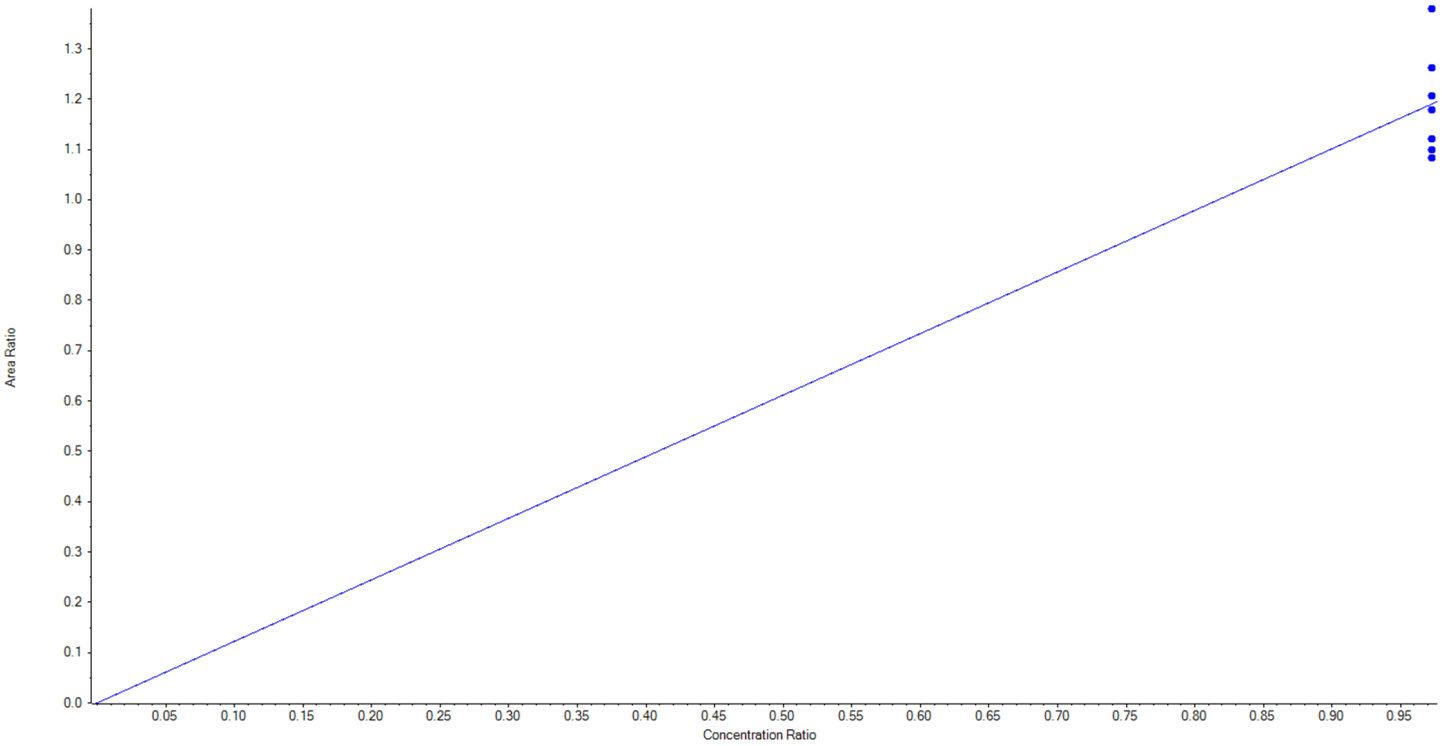
Calibration Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 12:30:55 PM

Analyte Name	13C3-PFBS	**Data File**	AC_09032019_5-369.wiff
MRM Transition	302.0 / 99.0	**Result Table**	19-0746A_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.22351 x (std. dev. = 0.10762) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	232.25	218.69	94.2
6	KP82	L2	True	232.25	246.35	106.1
7	KP83	L3	True	232.25	235.56	101.4
8	KP84	L4	True	232.25	211.56	91.1
9	KP85	L5	True	232.25	214.50	92.4
10	KP86	L6	True	232.25	229.93	99.0
11	KP87	L7	True	232.25	269.15	115.9



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Calibration Summary Report

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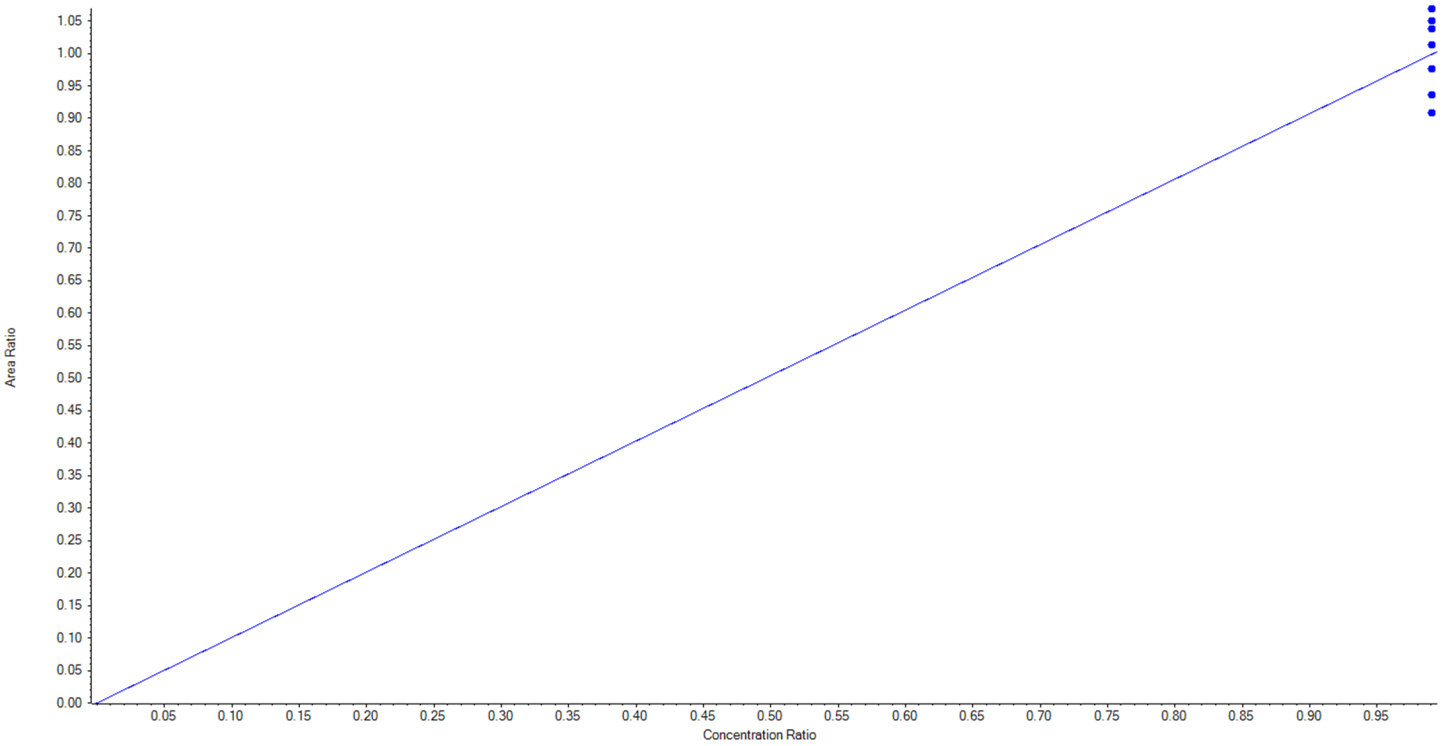
Printed: 04/09/2019 12:30:55 PM

Analyte Name	13C3-PFHxS	**Data File**	AC_09032019_5-369.wiff
MRM Transition	402.0 / 99.0	**Result Table**	19-0746A_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.00811 x (std. dev. = 0.06104) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	236.50	221.58	93.7
6	KP82	L2	True	236.50	248.74	105.2
7	KP83	L3	True	236.50	231.34	97.8
8	KP84	L4	True	236.50	215.07	90.9
9	KP85	L5	True	236.50	239.96	101.5
10	KP86	L6	True	236.50	253.07	107.0
11	KP87	L7	True	236.50	245.73	103.9



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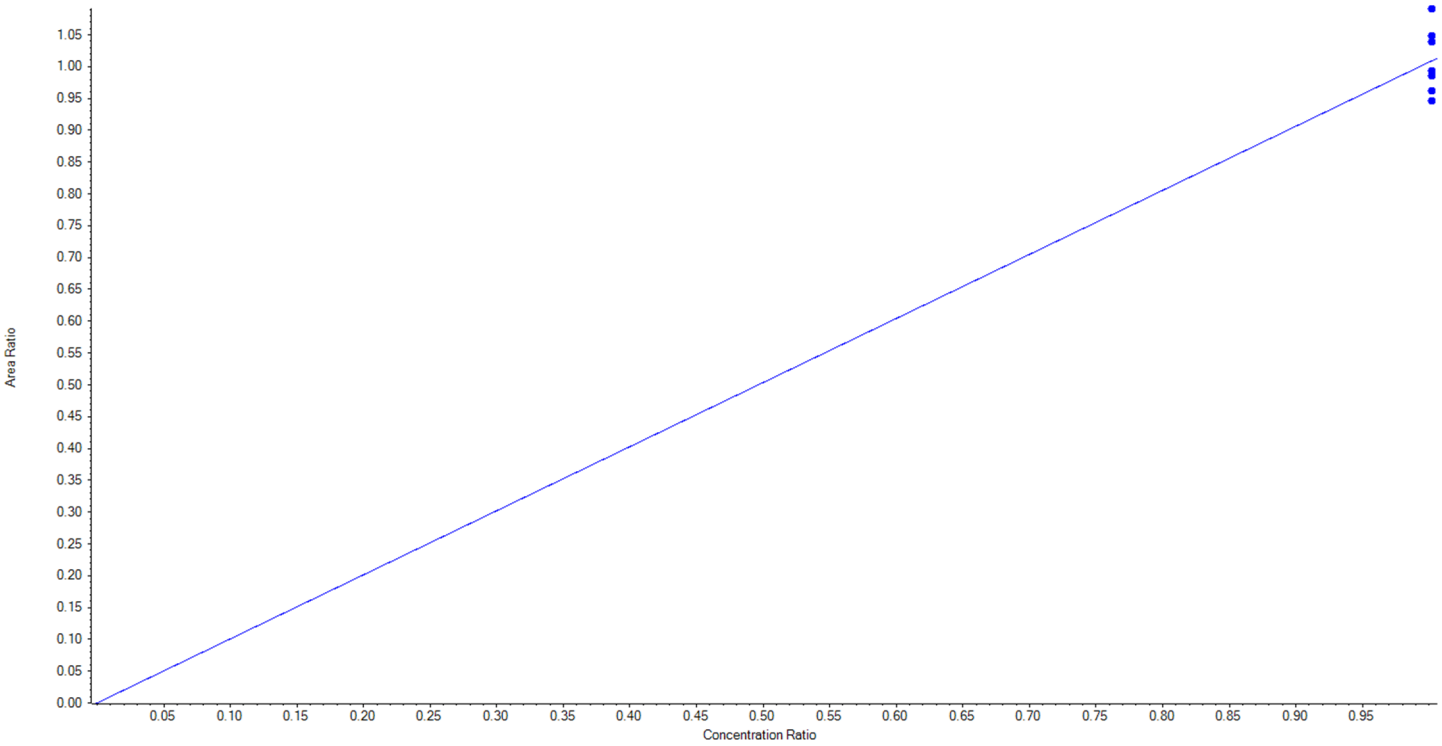
Calibration Summary Report

Analyte Name	13C8-PFOS	**Data File**	AC_09032019_5-369.wiff
MRM Transition	507.0 / 99.0	**Result Table**	19-0746A_SIS
Internal Standard	13C4-PFOS	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 1.00708 x (std. dev. = 0.05178) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	239.25	233.69	97.7
6	KP82	L2	True	239.25	227.88	95.3
7	KP83	L3	True	239.25	248.68	103.9
8	KP84	L4	True	239.25	224.39	93.8
9	KP85	L5	True	239.25	235.34	98.4
10	KP86	L6	True	239.25	258.62	108.1
11	KP87	L7	True	239.25	246.15	102.9



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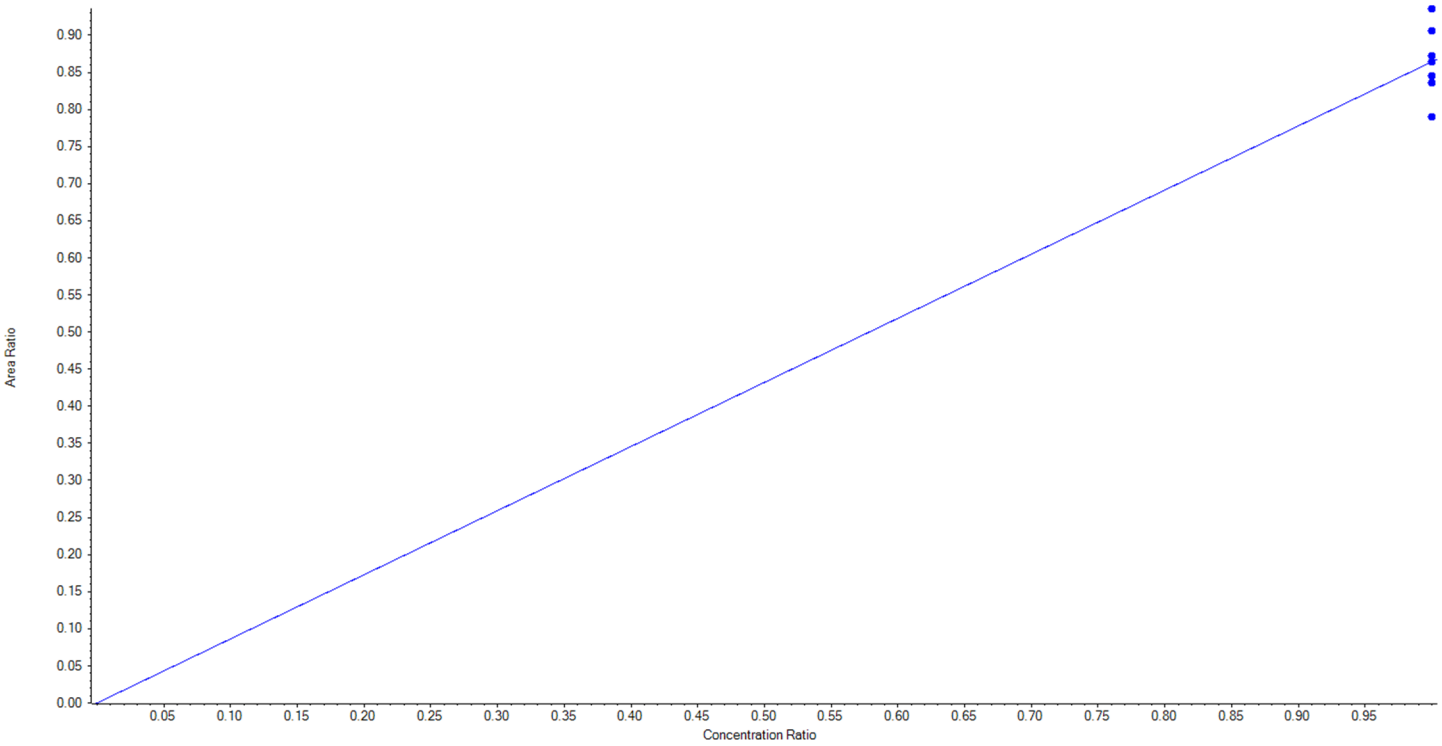
Printed: 04/09/2019 12:30:55 PM

Calibration Summary Report

Analyte Name	13C3-HFPO-DA	**Data File**	AC_09032019_5-369.wiff
MRM Transition	287.0 / 169.0	**Result Table**	19-0746A_SIS
Internal Standard	13C2-PFOA	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 12:26:18 PM	**Acquisition Method**	5-0369.dam

Regression Equation: y = 0.86427 x (std. dev. = 0.04762) (weighting: None)

Vial	Sample Name	Sample ID	Used for ICAL	Target Conc. (ng/L)	Calculated Conc. (ng/L)	Recovery (%)
5	KP81	L1	True	250.00	241.90	96.8
6	KP82	L2	True	250.00	228.38	91.4
7	KP83	L3	True	250.00	244.65	97.9
8	KP84	L4	True	250.00	252.24	100.9
9	KP85	L5	True	250.00	270.65	108.3
10	KP86	L6	True	250.00	250.13	100.1
11	KP87	L7	True	250.00	262.06	104.8



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	Isotope Dilution Calibration Curve Concentrations (ng/L)							ICC (ng/L)
	KP81	KP82	KP83	KP84	KP85	KP86	KP87	KP89
PFBA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFPeA	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
PFHxA	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
PFHpA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFOA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFNA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFDA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFUnA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFDoA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFTrDA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFTeDA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
NMeFOSAA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
NEtFOSAA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFOSA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFBS	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,000.00
PFPeS	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFHxS (Branched)	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
PFHpS	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
PFOS (Branched)	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
PFDS	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
PFNS	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
4:2FTS	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
6:2FTS	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
8:2FTS	101.00	252.50	505.00	1,010.00	2,525.00	10,100.00	20,200.00	1,010.00
3:3 FTCA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
5:3 FTCA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
7:3 FTCA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
HFPO-DA	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
Adona	100.00	250.00	500.00	1,000.00	2,500.00	10,000.00	20,000.00	1,000.00
9Cl-PF3ONS	93.20	233.00	466.00	932.00	2,330.00	9,320.00	18,640.00	932.00
11Cl-PF3OUdS	94.20	235.50	471.00	942.00	2,355.00	9,420.00	18,840.00	942.00
	Surrogates / Extracted Internal Standards							
13C4-PFBA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C5-PFPeA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C5-PFHxA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C4-PFHpA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C8-PFOA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C9-PFNA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C6-PFDA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C7-PFUnA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C2-PFDoA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C2-PFTeDA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
d3-MeFOSAA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
d5-EtFOSAA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C8-FOSA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C3-PFBS	232.25	232.25	232.25	232.25	232.25	232.25	232.25	232.25
13C3-PFHxS	236.50	236.50	236.50	236.50	236.50	236.50	236.50	236.50
13C8-PFOS	239.25	239.25	239.25	239.25	239.25	239.25	239.25	239.25
13C2-4:2FTS	233.75	233.75	233.75	233.75	233.75	233.75	233.75	233.75
13C2-6:2FTS	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25
13C2-8:2FTS	239.50	239.50	239.50	239.50	239.50	239.50	239.50	239.50
13C3-HFPO-DA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
	Internal Standards							
13C3-PFBA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C2-PFOA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C2-PFDA	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
13C4-PFOS	238.75	238.75	238.75	238.75	238.75	238.75	238.75	238.75

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QC Summary Report

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Sample Name	KP89 ICC	**Injection Vial**	10
Sample ID	ICC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:41:25 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	946.28	1000.00	94.63
PFBS_2	298.9 / 99.0	1.45	1009.62	1000.00	100.96
PFHxA_1	313.0 / 269.0	1.77	1019.68	1010.00	100.96
PFHxA_2	313.0 / 119.0	1.76	1002.67	1010.00	99.27
PFHpA_1	363.0 / 319.0	2.17	1035.64	1000.00	103.56
PFHpA_2	363.0 / 169.0	2.16	994.81	1000.00	99.48
PFHxS_1	399.0 / 80.0	2.19	1044.03	1010.00	103.37
PFHxS_2	399.0 / 99.0	2.19	973.47	1010.00	96.38
PFOA_1	413.0 / 369.0	2.57	991.14	1000.00	99.11
PFOA_2	413.0 / 169.0	2.57	997.12	1000.00	99.71
PFNA_1	463.0 / 419.0	2.96	1032.73	1000.00	103.27
PFNA_2	463.0 / 219.0	2.96	994.92	1000.00	99.49
PFOS_1	499.0 / 80.0	2.96	1013.11	1010.00	100.31
PFOS_2	499.0 / 99.0	2.96	988.69	1010.00	97.89
PFDA_1	513.0 / 469.0	3.31	1034.49	1000.00	103.45
PFDA_2	513.0 / 219.0	3.31	878.18	1000.00	87.82
PFUnA_1	563.0 / 519.0	3.63	1024.47	1000.00	102.45
PFUnA_2	563.0 / 269.0	3.63	981.15	1000.00	98.11
PFDoA_1	613.0 / 569.0	3.91	1084.76	1000.00	108.48
PFDoA_2	613.0 / 319.0	3.91	1032.02	1000.00	103.20
PFTrDA_1	663.0 / 619.0	4.16	1075.12	1000.00	107.51
PFTrDA_2	663.0 / 169.0	4.15	1077.29	1000.00	107.73
PFTeDA_1	713.0 / 669.0	4.37	1087.85	1000.00	108.78
PFTeDA_2	713.0 / 169.0	4.37	1117.09	1000.00	111.71
NMeFOSAA_1	570.0 / 419.0	3.47	1028.19	1000.00	102.82
NMeFOSAA_2	570.0 / 512.0	3.47	1085.15	1000.00	108.52
NEtFOSAA_1	584.0 / 419.0	3.63	1086.19	1000.00	108.62
NEtFOSAA_2	584.0 / 483.0	3.63	1014.16	1000.00	101.42
HFPO-DA_1	285.0 / 169.0	1.88	1110.81	1000.00	111.08
HFPO-DA_2	285.0 / 118.8	1.88	1153.59	1000.00	115.36
ADONA_1	377.0 / 251.0	2.20	1223.30	1000.00	122.33
ADONA_2	377.0 / 85.0	2.20	1239.36	1000.00	123.94
9Cl-PF3ONS_1	531.0 / 351.0	3.16	1090.69	932.00	117.03
9Cl-PF3ONS_2	531.0 / 83.0	3.16	1131.18	932.00	121.37
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	1174.17	942.00	124.65
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	1196.31	942.00	127.00

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 5:12:25 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	2504.49	2525.00	99.19
PFBS_2	298.9 / 99.0	1.45	2562.78	2525.00	101.50
PFHxA_1	313.0 / 269.0	1.76	2259.48	2525.00	89.48
PFHxA_2	313.0 / 119.0	1.76	2308.55	2525.00	91.43
PFHpA_1	363.0 / 319.0	2.16	2578.87	2500.00	103.15
PFHpA_2	363.0 / 169.0	2.16	2311.20	2500.00	92.45
PFHxS_1	399.0 / 80.0	2.19	2277.09	2525.00	90.18
PFHxS_2	399.0 / 99.0	2.19	2349.70	2525.00	93.06
PFOA_1	413.0 / 369.0	2.57	2469.97	2500.00	98.80
PFOA_2	413.0 / 169.0	2.57	2330.67	2500.00	93.23
PFNA_1	463.0 / 419.0	2.96	2521.46	2500.00	100.86
PFNA_2	463.0 / 219.0	2.96	2453.19	2500.00	98.13
PFOS_1	499.0 / 80.0	2.96	2702.49	2525.00	107.03
PFOS_2	499.0 / 99.0	2.96	2781.10	2525.00	110.14
PFDA_1	513.0 / 469.0	3.32	2435.68	2500.00	97.43
PFDA_2	513.0 / 219.0	3.32	2215.56	2500.00	88.62
PFUnA_1	563.0 / 519.0	3.63	2528.19	2500.00	101.13
PFUnA_2	563.0 / 269.0	3.63	2227.05	2500.00	89.08
PFDoA_1	613.0 / 569.0	3.92	2406.79	2500.00	96.27
PFDoA_2	613.0 / 319.0	3.91	2354.52	2500.00	94.18
PFTrDA_1	663.0 / 619.0	4.16	2544.92	2500.00	101.80
PFTrDA_2	663.0 / 169.0	4.16	2530.77	2500.00	101.23
PFTeDA_1	713.0 / 669.0	4.37	2564.16	2500.00	102.57
PFTeDA_2	713.0 / 169.0	4.37	2558.75	2500.00	102.35
NMeFOSAA_1	570.0 / 419.0	3.47	2299.93	2500.00	92.00
NMeFOSAA_2	570.0 / 512.0	3.47	2379.62	2500.00	95.18
NEtFOSAA_1	584.0 / 419.0	3.63	2432.64	2500.00	97.31
NEtFOSAA_2	584.0 / 483.0	3.63	2460.43	2500.00	98.42
HFPO-DA_1	285.0 / 169.0	1.87	2282.37	2500.00	91.29
HFPO-DA_2	285.0 / 118.8	1.87	2309.64	2500.00	92.39
ADONA_1	377.0 / 251.0	2.20	2337.51	2500.00	93.50
ADONA_2	377.0 / 85.0	2.20	2270.91	2500.00	90.84
9Cl-PF3ONS_1	531.0 / 351.0	3.16	2274.50	2330.00	97.62
9Cl-PF3ONS_2	531.0 / 83.0	3.16	2320.18	2330.00	99.58
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	2428.92	2355.00	103.14
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	2257.18	2355.00	95.85

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	34
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 7:00:24 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.44	958.42	1010.00	94.89
PFBS_2	298.9 / 99.0	1.44	1003.72	1010.00	99.38
PFHxA_1	313.0 / 269.0	1.75	968.27	1010.00	95.87
PFHxA_2	313.0 / 119.0	1.75	973.23	1010.00	96.36
PFHpA_1	363.0 / 319.0	2.16	969.14	1000.00	96.91
PFHpA_2	363.0 / 169.0	2.16	1083.00	1000.00	108.30
PFHxS_1	399.0 / 80.0	2.18	932.46	1010.00	92.32
PFHxS_2	399.0 / 99.0	2.18	925.73	1010.00	91.66
PFOA_1	413.0 / 369.0	2.57	1005.43	1000.00	100.54
PFOA_2	413.0 / 169.0	2.57	919.32	1000.00	91.93
PFNA_1	463.0 / 419.0	2.96	936.19	1000.00	93.62
PFNA_2	463.0 / 219.0	2.96	942.24	1000.00	94.22
PFOS_1	499.0 / 80.0	2.96	1063.31	1010.00	105.28
PFOS_2	499.0 / 99.0	2.96	1035.75	1010.00	102.55
PFDA_1	513.0 / 469.0	3.31	979.35	1000.00	97.93
PFDA_2	513.0 / 219.0	3.31	1044.19	1000.00	104.42
PFUnA_1	563.0 / 519.0	3.63	1020.77	1000.00	102.08
PFUnA_2	563.0 / 269.0	3.63	1033.17	1000.00	103.32
PFDoA_1	613.0 / 569.0	3.91	1005.83	1000.00	100.58
PFDoA_2	613.0 / 319.0	3.91	989.53	1000.00	98.95
PFTrDA_1	663.0 / 619.0	4.16	1041.58	1000.00	104.16
PFTrDA_2	663.0 / 169.0	4.15	1005.26	1000.00	100.53
PFTeDA_1	713.0 / 669.0	4.37	1019.51	1000.00	101.95
PFTeDA_2	713.0 / 169.0	4.37	1057.61	1000.00	105.76
NMeFOSAA_1	570.0 / 419.0	3.47	1002.19	1000.00	100.22
NMeFOSAA_2	570.0 / 512.0	3.47	1066.70	1000.00	106.67
NEtFOSAA_1	584.0 / 419.0	3.63	988.66	1000.00	98.87
NEtFOSAA_2	584.0 / 483.0	3.63	937.97	1000.00	93.80
HFPO-DA_1	285.0 / 169.0	1.87	972.20	1000.00	97.22
HFPO-DA_2	285.0 / 118.8	1.87	977.36	1000.00	97.74
ADONA_1	377.0 / 251.0	2.20	951.94	1000.00	95.19
ADONA_2	377.0 / 85.0	2.20	948.92	1000.00	94.89
9Cl-PF3ONS_1	531.0 / 351.0	3.16	911.65	932.00	97.82
9Cl-PF3ONS_2	531.0 / 83.0	3.15	800.03	932.00	85.84
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	967.79	942.00	102.74
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	813.10	942.00	86.32

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	45
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 8:59:12 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	2492.85	2525.00	98.73
PFBS_2	298.9 / 99.0	1.44	2567.03	2525.00	101.66
PFHxA_1	313.0 / 269.0	1.76	2823.28	2525.00	111.81
PFHxA_2	313.0 / 119.0	1.76	2612.61	2525.00	103.47
PFHpA_1	363.0 / 319.0	2.16	2400.66	2500.00	96.03
PFHpA_2	363.0 / 169.0	2.16	2185.76	2500.00	87.43
PFHxS_1	399.0 / 80.0	2.18	1998.72	2525.00	79.16
PFHxS_2	399.0 / 99.0	2.18	2074.73	2525.00	82.17
PFOA_1	413.0 / 369.0	2.57	2475.81	2500.00	99.03
PFOA_2	413.0 / 169.0	2.56	2484.65	2500.00	99.39
PFNA_1	463.0 / 419.0	2.96	2311.86	2500.00	92.47
PFNA_2	463.0 / 219.0	2.96	2386.78	2500.00	95.47
PFOS_1	499.0 / 80.0	2.96	2218.50	2525.00	87.86
PFOS_2	499.0 / 99.0	2.95	2237.05	2525.00	88.60
PFDA_1	513.0 / 469.0	3.31	2511.82	2500.00	100.47
PFDA_2	513.0 / 219.0	3.31	2340.18	2500.00	93.61
PFUnA_1	563.0 / 519.0	3.63	2487.23	2500.00	99.49
PFUnA_2	563.0 / 269.0	3.63	2422.61	2500.00	96.90
PFDoA_1	613.0 / 569.0	3.91	2528.02	2500.00	101.12
PFDoA_2	613.0 / 319.0	3.91	2408.91	2500.00	96.36
PFTrDA_1	663.0 / 619.0	4.15	2464.09	2500.00	98.56
PFTrDA_2	663.0 / 169.0	4.15	2554.92	2500.00	102.20
PFTeDA_1	713.0 / 669.0	4.37	2555.11	2500.00	102.20
PFTeDA_2	713.0 / 169.0	4.37	2540.10	2500.00	101.60
NMeFOSAA_1	570.0 / 419.0	3.47	2500.07	2500.00	100.00
NMeFOSAA_2	570.0 / 512.0	3.47	2624.20	2500.00	104.97
NEtFOSAA_1	584.0 / 419.0	3.63	2494.21	2500.00	99.77
NEtFOSAA_2	584.0 / 483.0	3.63	2093.30	2500.00	83.73
HFPO-DA_1	285.0 / 169.0	1.87	2402.39	2500.00	96.10
HFPO-DA_2	285.0 / 118.8	1.87	2432.21	2500.00	97.29
ADONA_1	377.0 / 251.0	2.19	2033.59	2500.00	81.34
ADONA_2	377.0 / 85.0	2.20	1841.34	2500.00	73.65
9Cl-PF3ONS_1	531.0 / 351.0	3.15	2217.51	2330.00	95.17
9Cl-PF3ONS_2	531.0 / 83.0	3.15	1990.43	2330.00	85.43
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	2461.90	2355.00	104.54
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	2514.68	2355.00	106.78

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	54
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 10:36:23 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	1036.43	1010.00	102.62
PFBS_2	298.9 / 99.0	1.45	1055.89	1010.00	104.54
PFHxA_1	313.0 / 269.0	1.77	992.63	1010.00	98.28
PFHxA_2	313.0 / 119.0	1.77	1162.97	1010.00	115.15
PFHpA_1	363.0 / 319.0	2.16	978.03	1000.00	97.80
PFHpA_2	363.0 / 169.0	2.16	1072.04	1000.00	107.20
PFHxS_1	399.0 / 80.0	2.19	908.64	1010.00	89.96
PFHxS_2	399.0 / 99.0	2.19	924.50	1010.00	91.53
PFOA_1	413.0 / 369.0	2.57	1022.95	1000.00	102.30
PFOA_2	413.0 / 169.0	2.57	1076.31	1000.00	107.63
PFNA_1	463.0 / 419.0	2.96	986.09	1000.00	98.61
PFNA_2	463.0 / 219.0	2.96	902.21	1000.00	90.22
PFOS_1	499.0 / 80.0	2.96	973.91	1010.00	96.43
PFOS_2	499.0 / 99.0	2.96	916.82	1010.00	90.77
PFDA_1	513.0 / 469.0	3.31	1016.27	1000.00	101.63
PFDA_2	513.0 / 219.0	3.31	918.63	1000.00	91.86
PFUnA_1	563.0 / 519.0	3.63	1035.18	1000.00	103.52
PFUnA_2	563.0 / 269.0	3.63	988.31	1000.00	98.83
PFDoA_1	613.0 / 569.0	3.91	1071.43	1000.00	107.14
PFDoA_2	613.0 / 319.0	3.91	1057.50	1000.00	105.75
PFTrDA_1	663.0 / 619.0	4.15	999.06	1000.00	99.91
PFTrDA_2	663.0 / 169.0	4.15	947.88	1000.00	94.79
PFTeDA_1	713.0 / 669.0	4.37	1022.93	1000.00	102.29
PFTeDA_2	713.0 / 169.0	4.37	1024.51	1000.00	102.45
NMeFOSAA_1	570.0 / 419.0	3.47	891.06	1000.00	89.11
NMeFOSAA_2	570.0 / 512.0	3.47	905.95	1000.00	90.60
NEtFOSAA_1	584.0 / 419.0	3.63	1045.56	1000.00	104.56
NEtFOSAA_2	584.0 / 483.0	3.63	841.99	1000.00	84.20
HFPO-DA_1	285.0 / 169.0	1.88	981.28	1000.00	98.13
HFPO-DA_2	285.0 / 118.8	1.88	852.76	1000.00	85.28
ADONA_1	377.0 / 251.0	2.20	926.46	1000.00	92.65
ADONA_2	377.0 / 85.0	2.20	870.82	1000.00	87.08
9Cl-PF3ONS_1	531.0 / 351.0	3.15	1009.30	932.00	108.29
9Cl-PF3ONS_2	531.0 / 83.0	3.16	861.84	932.00	92.47
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	1026.77	942.00	109.00
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	1037.23	942.00	110.11

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	45
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 12:35:16 PM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	2569.63	2525.00	101.77
PFBS_2	298.9 / 99.0	1.45	2619.25	2525.00	103.73
PFHxA_1	313.0 / 269.0	1.76	2504.88	2525.00	99.20
PFHxA_2	313.0 / 119.0	1.76	2254.76	2525.00	89.30
PFHpA_1	363.0 / 319.0	2.16	2431.54	2500.00	97.26
PFHpA_2	363.0 / 169.0	2.16	2479.60	2500.00	99.18
PFHxS_1	399.0 / 80.0	2.19	2056.19	2525.00	81.43
PFHxS_2	399.0 / 99.0	2.19	2144.03	2525.00	84.91
PFOA_1	413.0 / 369.0	2.57	2455.83	2500.00	98.23
PFOA_2	413.0 / 169.0	2.57	2459.58	2500.00	98.38
PFNA_1	463.0 / 419.0	2.96	2442.43	2500.00	97.70
PFNA_2	463.0 / 219.0	2.96	2456.93	2500.00	98.28
PFOS_1	499.0 / 80.0	2.96	2195.26	2525.00	86.94
PFOS_2	499.0 / 99.0	2.96	2260.83	2525.00	89.54
PFDA_1	513.0 / 469.0	3.31	2548.93	2500.00	101.96
PFDA_2	513.0 / 219.0	3.31	2392.07	2500.00	95.68
PFUnA_1	563.0 / 519.0	3.63	2441.15	2500.00	97.65
PFUnA_2	563.0 / 269.0	3.63	2358.28	2500.00	94.33
PFDoA_1	613.0 / 569.0	3.91	2575.30	2500.00	103.01
PFDoA_2	613.0 / 319.0	3.91	2644.04	2500.00	105.76
PFTrDA_1	663.0 / 619.0	4.16	2543.63	2500.00	101.75
PFTrDA_2	663.0 / 169.0	4.16	2560.44	2500.00	102.42
PFTeDA_1	713.0 / 669.0	4.37	2569.20	2500.00	102.77
PFTeDA_2	713.0 / 169.0	4.37	2604.91	2500.00	104.20
NMeFOSAA_1	570.0 / 419.0	3.47	2486.46	2500.00	99.46
NMeFOSAA_2	570.0 / 512.0	3.47	2540.94	2500.00	101.64
NEtFOSAA_1	584.0 / 419.0	3.63	2334.92	2500.00	93.40
NEtFOSAA_2	584.0 / 483.0	3.63	1903.49	2500.00	76.14
HFPO-DA_1	285.0 / 169.0	1.88	2220.05	2500.00	88.80
HFPO-DA_2	285.0 / 118.8	1.87	2290.83	2500.00	91.63
ADONA_1	377.0 / 251.0	2.20	2184.09	2500.00	87.36
ADONA_2	377.0 / 85.0	2.20	2040.70	2500.00	81.63
9Cl-PF3ONS_1	531.0 / 351.0	3.16	2125.18	2330.00	91.21
9Cl-PF3ONS_2	531.0 / 83.0	3.16	2146.19	2330.00	92.11
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	2571.62	2355.00	109.20
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	2626.75	2355.00	111.54

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QC Summary Report

Sample Name	KP84 ISC	**Injection Vial**	3
Sample ID	ISC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/2/2019 1:02:34 PM	**Data File**	AC_09022019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.48	1050.38	1010.00	104.00
PFBS_2	298.9 / 99.0	1.48	1045.85	1010.00	103.55
PFHxA_1	313.0 / 269.0	1.80	1083.02	1010.00	107.23
PFHxA_2	313.0 / 119.0	1.80	1060.27	1010.00	104.98
PFHpA_1	363.0 / 319.0	2.21	946.32	1000.00	94.63
PFHpA_2	363.0 / 169.0	2.21	760.99	1000.00	76.10
PFHxS_1	399.0 / 80.0	2.23	925.17	1010.00	91.60
PFHxS_2	399.0 / 99.0	2.23	1019.88	1010.00	100.98
PFOA_1	413.0 / 369.0	2.62	1019.60	1000.00	101.96
PFOA_2	413.0 / 169.0	2.62	1011.97	1000.00	101.20
PFNA_1	463.0 / 419.0	3.01	982.13	1000.00	98.21
PFNA_2	463.0 / 219.0	3.01	1038.20	1000.00	103.82
PFOS_1	499.0 / 80.0	3.01	893.89	1010.00	88.50
PFOS_2	499.0 / 99.0	3.01	916.44	1010.00	90.74
PFDA_1	513.0 / 469.0	3.37	997.55	1000.00	99.75
PFDA_2	513.0 / 219.0	3.38	1000.86	1000.00	100.09
PFUnA_1	563.0 / 519.0	3.69	995.20	1000.00	99.52
PFUnA_2	563.0 / 269.0	3.69	994.70	1000.00	99.47
PFDoA_1	613.0 / 569.0	3.98	1033.87	1000.00	103.39
PFDoA_2	613.0 / 319.0	3.98	1001.53	1000.00	100.15
PFTrDA_1	663.0 / 619.0	4.22	1086.76	1000.00	108.68
PFTrDA_2	663.0 / 169.0	4.22	954.93	1000.00	95.49
PFTeDA_1	713.0 / 669.0	4.44	1108.64	1000.00	110.86
PFTeDA_2	713.0 / 169.0	4.44	1094.52	1000.00	109.45
NMeFOSAA_1	570.0 / 419.0	3.53	944.52	1000.00	94.45
NMeFOSAA_2	570.0 / 512.0	3.53	979.12	1000.00	97.91
NEtFOSAA_1	584.0 / 419.0	3.69	962.29	1000.00	96.23
NEtFOSAA_2	584.0 / 483.0	3.69	987.66	1000.00	98.77
HFPO-DA_1	285.0 / 169.0	1.92	988.88	1000.00	98.89
HFPO-DA_2	285.0 / 118.8	1.92	1076.75	1000.00	107.68
ADONA_1	377.0 / 251.0	2.25	1030.24	1000.00	103.02
ADONA_2	377.0 / 85.0	2.25	959.56	1000.00	95.96
9Cl-PF3ONS_1	531.0 / 351.0	3.21	936.93	932.00	100.53
9Cl-PF3ONS_2	531.0 / 83.0	3.21	965.85	932.00	103.63
11Cl-pf3OUdS_1	631.0 / 451.0	3.83	1023.36	942.00	108.64
11Cl-pf3OUdS_2	631.0 / 83.0	3.83	1056.21	942.00	112.12

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	12
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/2/2019 2:39:32 PM	**Data File**	AC_09022019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.47	2441.20	2525.00	96.68
PFBS_2	298.9 / 99.0	1.47	2496.15	2525.00	98.86
PFHxA_1	313.0 / 269.0	1.79	2490.09	2525.00	98.62
PFHxA_2	313.0 / 119.0	1.79	2496.03	2525.00	98.85
PFHpA_1	363.0 / 319.0	2.19	2392.21	2500.00	95.69
PFHpA_2	363.0 / 169.0	2.20	2379.84	2500.00	95.19
PFHxS_1	399.0 / 80.0	2.22	2310.23	2525.00	91.49
PFHxS_2	399.0 / 99.0	2.22	2407.45	2525.00	95.34
PFOA_1	413.0 / 369.0	2.61	2520.17	2500.00	100.81
PFOA_2	413.0 / 169.0	2.60	2444.81	2500.00	97.79
PFNA_1	463.0 / 419.0	2.99	2326.70	2500.00	93.07
PFNA_2	463.0 / 219.0	2.99	2304.98	2500.00	92.20
PFOS_1	499.0 / 80.0	2.99	2840.63	2525.00	112.50
PFOS_2	499.0 / 99.0	2.99	3014.40	2525.00	119.38
PFDA_1	513.0 / 469.0	3.35	2430.58	2500.00	97.22
PFDA_2	513.0 / 219.0	3.35	2233.66	2500.00	89.35
PFUnA_1	563.0 / 519.0	3.67	2438.80	2500.00	97.55
PFUnA_2	563.0 / 269.0	3.67	2581.38	2500.00	103.26
PFDoA_1	613.0 / 569.0	3.95	2484.33	2500.00	99.37
PFDoA_2	613.0 / 319.0	3.95	2484.30	2500.00	99.37
PFTrDA_1	663.0 / 619.0	4.20	2671.80	2500.00	106.87
PFTrDA_2	663.0 / 169.0	4.19	2721.83	2500.00	108.87
PFTeDA_1	713.0 / 669.0	4.41	2584.33	2500.00	103.37
PFTeDA_2	713.0 / 169.0	4.41	2605.09	2500.00	104.20
NMeFOSAA_1	570.0 / 419.0	3.50	2858.80	2500.00	114.35
NMeFOSAA_2	570.0 / 512.0	3.50	2864.21	2500.00	114.57
NEtFOSAA_1	584.0 / 419.0	3.67	2421.80	2500.00	96.87
NEtFOSAA_2	584.0 / 483.0	3.66	1900.01	2500.00	76.00
HFPO-DA_1	285.0 / 169.0	1.91	2335.36	2500.00	93.41
HFPO-DA_2	285.0 / 118.8	1.90	2413.19	2500.00	96.53
ADONA_1	377.0 / 251.0	2.24	2422.25	2500.00	96.89
ADONA_2	377.0 / 85.0	2.24	2339.36	2500.00	93.57
9Cl-PF3ONS_1	531.0 / 351.0	3.19	2092.36	2330.00	89.80
9Cl-PF3ONS_2	531.0 / 83.0	3.19	1954.24	2330.00	83.87
11Cl-pf3OUdS_1	631.0 / 451.0	3.80	2460.22	2355.00	104.47
11Cl-pf3OUdS_2	631.0 / 83.0	3.80	2071.75	2355.00	87.97

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QC Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 12:34:46 PM

Sample Name	KP89 ICC	**Injection Vial**	10
Sample ID	ICC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:41:25 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.91	262.35	250.00	104.94
d3-MeFOSAA	573.0 / 419.0	3.46	264.45	250.00	105.78
d5-EtFOSAA	589.0 / 419.0	3.62	254.62	250.00	101.85
13C5-PFHxA	318.0 / 273.0	1.75	262.96	250.00	105.19
13C4-PFHpA	367.0 / 322.0	2.16	254.76	250.00	101.90
13C8-PFOA	421.0 / 376.0	2.56	263.28	250.00	105.31
13C9-PFNA	472.0 / 427.0	2.95	242.36	250.00	96.94
13C6-PFDA	519.0 / 474.0	3.30	262.74	250.00	105.10
13C7-PFUnA	570.0 / 525.0	3.62	263.72	250.00	105.49
13C2-PFTeDA	715.0 / 670.0	4.37	257.35	250.00	102.94
13C3-PFBS	302.0 / 99.0	1.44	236.54	232.25	101.85
13C3-PFHxS	402.0 / 99.0	2.18	232.14	236.50	98.16
13C8-PFOS	507.0 / 99.0	2.95	226.51	239.25	94.68
13C3-HFPO-DA	287.0 / 169.0	1.88	249.56	250.00	99.82

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	24
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 5:12:25 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.91	260.50	250.00	104.20
d3-MeFOSAA	573.0 / 419.0	3.47	315.93	250.00	126.37
d5-EtFOSAA	589.0 / 419.0	3.63	279.88	250.00	111.95
13C5-PFHxA	318.0 / 273.0	1.75	271.29	250.00	108.52
13C4-PFHpA	367.0 / 322.0	2.16	247.05	250.00	98.82
13C8-PFOA	421.0 / 376.0	2.57	260.86	250.00	104.34
13C9-PFNA	472.0 / 427.0	2.95	239.14	250.00	95.65
13C6-PFDA	519.0 / 474.0	3.31	252.28	250.00	100.91
13C7-PFUnA	570.0 / 525.0	3.62	258.09	250.00	103.24
13C2-PFTeDA	715.0 / 670.0	4.37	251.74	250.00	100.70
13C3-PFBS	302.0 / 99.0	1.43	240.10	232.25	103.38
13C3-PFHxS	402.0 / 99.0	2.18	262.12	236.50	110.83
13C8-PFOS	507.0 / 99.0	2.95	272.94	239.25	114.08
13C3-HFPO-DA	287.0 / 169.0	1.87	250.30	250.00	100.12

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	34
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 7:00:24 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.91	255.83	250.00	102.33
d3-MeFOSAA	573.0 / 419.0	3.46	251.70	250.00	100.68
d5-EtFOSAA	589.0 / 419.0	3.62	263.30	250.00	105.32
13C5-PFHxA	318.0 / 273.0	1.74	255.59	250.00	102.24
13C4-PFHpA	367.0 / 322.0	2.15	255.63	250.00	102.25
13C8-PFOA	421.0 / 376.0	2.56	249.67	250.00	99.87
13C9-PFNA	472.0 / 427.0	2.95	248.54	250.00	99.42
13C6-PFDA	519.0 / 474.0	3.30	259.51	250.00	103.80
13C7-PFUnA	570.0 / 525.0	3.62	258.28	250.00	103.31
13C2-PFTeDA	715.0 / 670.0	4.37	252.73	250.00	101.09
13C3-PFBS	302.0 / 99.0	1.43	239.39	232.25	103.07
13C3-PFHxS	402.0 / 99.0	2.18	246.44	236.50	104.20
13C8-PFOS	507.0 / 99.0	2.95	262.86	239.25	109.87
13C3-HFPO-DA	287.0 / 169.0	1.87	244.22	250.00	97.69

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	45
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 8:59:12 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.90	261.70	250.00	104.68
d3-MeFOSAA	573.0 / 419.0	3.46	260.21	250.00	104.08
d5-EtFOSAA	589.0 / 419.0	3.62	257.77	250.00	103.11
13C5-PFHxA	318.0 / 273.0	1.74	264.53	250.00	105.81
13C4-PFHpA	367.0 / 322.0	2.15	280.73	250.00	112.29
13C8-PFOA	421.0 / 376.0	2.56	274.68	250.00	109.87
13C9-PFNA	472.0 / 427.0	2.95	257.94	250.00	103.18
13C6-PFDA	519.0 / 474.0	3.30	258.04	250.00	103.22
13C7-PFUnA	570.0 / 525.0	3.61	261.97	250.00	104.79
13C2-PFTeDA	715.0 / 670.0	4.36	269.81	250.00	107.92
13C3-PFBS	302.0 / 99.0	1.43	232.19	232.25	99.97
13C3-PFHxS	402.0 / 99.0	2.17	290.97	236.50	123.03
13C8-PFOS	507.0 / 99.0	2.94	259.88	239.25	108.62
13C3-HFPO-DA	287.0 / 169.0	1.87	257.15	250.00	102.86

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	54
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 10:36:23 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.90	241.02	250.00	96.41
d3-MeFOSAA	573.0 / 419.0	3.46	271.72	250.00	108.69
d5-EtFOSAA	589.0 / 419.0	3.62	214.86	250.00	85.95
13C5-PFHxA	318.0 / 273.0	1.75	277.46	250.00	110.99
13C4-PFHpA	367.0 / 322.0	2.16	271.68	250.00	108.67
13C8-PFOA	421.0 / 376.0	2.56	259.37	250.00	103.75
13C9-PFNA	472.0 / 427.0	2.95	250.99	250.00	100.40
13C6-PFDA	519.0 / 474.0	3.30	249.06	250.00	99.63
13C7-PFUnA	570.0 / 525.0	3.62	249.44	250.00	99.78
13C2-PFTeDA	715.0 / 670.0	4.36	252.38	250.00	100.95
13C3-PFBS	302.0 / 99.0	1.44	201.84	232.25	86.90
13C3-PFHxS	402.0 / 99.0	2.18	232.18	236.50	98.17
13C8-PFOS	507.0 / 99.0	2.95	219.88	239.25	91.90
13C3-HFPO-DA	287.0 / 169.0	1.88	256.72	250.00	102.69

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	45
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 12:35:16 PM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.91	246.62	250.00	98.65
d3-MeFOSAA	573.0 / 419.0	3.46	261.26	250.00	104.50
d5-EtFOSAA	589.0 / 419.0	3.63	266.84	250.00	106.74
13C5-PFHxA	318.0 / 273.0	1.75	264.07	250.00	105.63
13C4-PFHpA	367.0 / 322.0	2.16	259.59	250.00	103.84
13C8-PFOA	421.0 / 376.0	2.56	250.15	250.00	100.06
13C9-PFNA	472.0 / 427.0	2.95	239.10	250.00	95.64
13C6-PFDA	519.0 / 474.0	3.30	245.70	250.00	98.28
13C7-PFUnA	570.0 / 525.0	3.62	256.07	250.00	102.43
13C2-PFTeDA	715.0 / 670.0	4.37	253.65	250.00	101.46
13C3-PFBS	302.0 / 99.0	1.44	210.43	232.25	90.61
13C3-PFHxS	402.0 / 99.0	2.18	249.67	236.50	105.57
13C8-PFOS	507.0 / 99.0	2.95	248.63	239.25	103.92
13C3-HFPO-DA	287.0 / 169.0	1.87	255.26	250.00	102.10

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QC Summary Report

Sample Name	KP84 ISC	**Injection Vial**	3
Sample ID	ISC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/2/2019 1:02:34 PM	**Data File**	AC_09022019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.97	256.95	250.00	102.78
d3-MeFOSAA	573.0 / 419.0	3.52	282.71	250.00	113.09
d5-EtFOSAA	589.0 / 419.0	3.68	255.25	250.00	102.10
13C5-PFHxA	318.0 / 273.0	1.79	239.98	250.00	95.99
13C4-PFHpA	367.0 / 322.0	2.20	259.74	250.00	103.89
13C8-PFOA	421.0 / 376.0	2.61	234.46	250.00	93.78
13C9-PFNA	472.0 / 427.0	3.01	241.90	250.00	96.76
13C6-PFDA	519.0 / 474.0	3.36	249.02	250.00	99.61
13C7-PFUnA	570.0 / 525.0	3.68	269.49	250.00	107.80
13C2-PFTeDA	715.0 / 670.0	4.44	254.86	250.00	101.94
13C3-PFBS	302.0 / 99.0	1.47	203.24	232.25	87.51
13C3-PFHxS	402.0 / 99.0	2.23	219.65	236.50	92.87
13C8-PFOS	507.0 / 99.0	3.00	242.57	239.25	101.39
13C3-HFPO-DA	287.0 / 169.0	1.92	230.93	250.00	92.37

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	12
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/2/2019 2:39:32 PM	**Data File**	AC_09022019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.94	279.35	250.00	111.74
d3-MeFOSAA	573.0 / 419.0	3.50	256.20	250.00	102.48
d5-EtFOSAA	589.0 / 419.0	3.66	266.29	250.00	106.52
13C5-PFHxA	318.0 / 273.0	1.78	258.06	250.00	103.22
13C4-PFHpA	367.0 / 322.0	2.19	264.65	250.00	105.86
13C8-PFOA	421.0 / 376.0	2.60	254.45	250.00	101.78
13C9-PFNA	472.0 / 427.0	2.98	245.27	250.00	98.11
13C6-PFDA	519.0 / 474.0	3.34	261.58	250.00	104.63
13C7-PFUnA	570.0 / 525.0	3.66	271.96	250.00	108.78
13C2-PFTeDA	715.0 / 670.0	4.41	276.07	250.00	110.43
13C3-PFBS	302.0 / 99.0	1.46	230.89	232.25	99.41
13C3-PFHxS	402.0 / 99.0	2.22	233.51	236.50	98.74
13C8-PFOS	507.0 / 99.0	2.98	263.52	239.25	110.14
13C3-HFPO-DA	287.0 / 169.0	1.90	244.18	250.00	97.67

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QC Summary Report

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Sample Name	KP89 ICC	**Injection Vial**	13
Sample ID	ICC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 1:52:33 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.46	1072.36	1000.00	107.24
PFBS_2	298.9 / 99.0	1.46	1060.28	1000.00	106.03
PFHxA_1	313.0 / 269.0	1.78	1026.16	1010.00	101.60
PFHxA_2	313.0 / 119.0	1.78	1057.63	1010.00	104.72
PFHpA_1	363.0 / 319.0	2.18	992.51	1000.00	99.25
PFHpA_2	363.0 / 169.0	2.18	864.96	1000.00	86.50
PFHxS_1	399.0 / 80.0	2.21	1078.30	1010.00	106.76
PFHxS_2	399.0 / 99.0	2.21	1083.81	1010.00	107.31
PFOA_1	413.0 / 369.0	2.60	996.64	1000.00	99.66
PFOA_2	413.0 / 169.0	2.60	894.10	1000.00	89.41
PFNA_1	463.0 / 419.0	2.99	972.60	1000.00	97.26
PFNA_2	463.0 / 219.0	2.99	887.56	1000.00	88.76
PFOS_1	499.0 / 80.0	2.99	960.40	1010.00	95.09
PFOS_2	499.0 / 99.0	2.98	958.24	1010.00	94.88
PFDA_1	513.0 / 469.0	3.34	990.11	1000.00	99.01
PFDA_2	513.0 / 219.0	3.34	970.44	1000.00	97.04
PFUnA_1	563.0 / 519.0	3.66	922.65	1000.00	92.26
PFUnA_2	563.0 / 269.0	3.66	840.68	1000.00	84.07
PFDoA_1	613.0 / 569.0	3.95	1104.82	1000.00	110.48
PFDoA_2	613.0 / 319.0	3.95	1123.67	1000.00	112.37
PFTrDA_1	663.0 / 619.0	4.19	1049.55	1000.00	104.95
PFTrDA_2	663.0 / 169.0	4.19	1009.49	1000.00	100.95
PFTeDA_1	713.0 / 669.0	4.41	1033.55	1000.00	103.35
PFTeDA_2	713.0 / 169.0	4.41	1070.77	1000.00	107.08
NMeFOSAA_1	570.0 / 419.0	3.50	1001.48	1000.00	100.15
NMeFOSAA_2	570.0 / 512.0	3.50	982.13	1000.00	98.21
NEtFOSAA_1	584.0 / 419.0	3.66	1170.76	1000.00	117.08
NEtFOSAA_2	584.0 / 483.0	3.66	958.73	1000.00	95.87
HFPO-DA_1	285.0 / 169.0	1.90	1187.80	1000.00	118.78
HFPO-DA_2	285.0 / 118.8	1.90	1190.84	1000.00	119.08
ADONA_1	377.0 / 251.0	2.22	1238.68	1000.00	123.87
ADONA_2	377.0 / 85.0	2.22	1277.11	1000.00	127.71
9Cl-PF3ONS_1	531.0 / 351.0	3.19	1035.71	932.00	111.13
9Cl-PF3ONS_2	531.0 / 83.0	3.18	1033.50	932.00	110.89
11Cl-pf3OUdS_1	631.0 / 451.0	3.80	1157.86	942.00	122.92
11Cl-pf3OUdS_2	631.0 / 83.0	3.80	1140.98	942.00	121.12

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QC Summary Report

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Printed: 04/09/2019 2:26:51 PM

Sample Name	KP84 CCV	**Injection Vial**	28
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 4:24:03 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.46	1114.54	1010.00	110.35
PFBS_2	298.9 / 99.0	1.46	1116.27	1010.00	110.52
PFHxA_1	313.0 / 269.0	1.78	1601.11	1010.00	158.53
PFHxA_2	313.0 / 119.0	1.78	1461.14	1010.00	144.67
PFHpA_1	363.0 / 319.0	2.18	1065.35	1000.00	106.54
PFHpA_2	363.0 / 169.0	2.18	875.26	1000.00	87.53
PFHxS_1	399.0 / 80.0	2.20	1292.68	1010.00	127.99
PFHxS_2	399.0 / 99.0	2.20	1303.30	1010.00	129.04
PFOA_1	413.0 / 369.0	2.59	1226.29	1000.00	122.63
PFOA_2	413.0 / 169.0	2.58	1294.45	1000.00	129.44
PFNA_1	463.0 / 419.0	2.97	1009.91	1000.00	100.99
PFNA_2	463.0 / 219.0	2.98	980.42	1000.00	98.04
PFOS_1	499.0 / 80.0	2.97	1103.75	1010.00	109.28
PFOS_2	499.0 / 99.0	2.97	1108.34	1010.00	109.74
PFDA_1	513.0 / 469.0	3.33	914.85	1000.00	91.49
PFDA_2	513.0 / 219.0	3.33	931.01	1000.00	93.10
PFUnA_1	563.0 / 519.0	3.65	981.07	1000.00	98.11
PFUnA_2	563.0 / 269.0	3.65	904.39	1000.00	90.44
PFDoA_1	613.0 / 569.0	3.94	1022.23	1000.00	102.22
PFDoA_2	613.0 / 319.0	3.94	1057.36	1000.00	105.74
PFTrDA_1	663.0 / 619.0	4.18	1055.62	1000.00	105.56
PFTrDA_2	663.0 / 169.0	4.18	1054.44	1000.00	105.44
PFTeDA_1	713.0 / 669.0	4.40	1026.29	1000.00	102.63
PFTeDA_2	713.0 / 169.0	4.40	1027.42	1000.00	102.74
NMeFOSAA_1	570.0 / 419.0	3.49	936.88	1000.00	93.69
NMeFOSAA_2	570.0 / 512.0	3.49	1028.47	1000.00	102.85
NEtFOSAA_1	584.0 / 419.0	3.65	1011.28	1000.00	101.13
NEtFOSAA_2	584.0 / 483.0	3.65	1092.11	1000.00	109.21
HFPO-DA_1	285.0 / 169.0	1.89	1016.14	1000.00	101.61
HFPO-DA_2	285.0 / 118.8	1.89	938.59	1000.00	93.86
ADONA_1	377.0 / 251.0	2.21	1026.94	1000.00	102.69
ADONA_2	377.0 / 85.0	2.22	1048.94	1000.00	104.89
9Cl-PF3ONS_1	531.0 / 351.0	3.17	990.45	932.00	106.27
9Cl-PF3ONS_2	531.0 / 83.0	3.18	989.76	932.00	106.20
11Cl-pf3OUdS_1	631.0 / 451.0	3.79	941.18	942.00	99.91
11Cl-pf3OUdS_2	631.0 / 83.0	3.78	659.70	942.00	70.03

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	4
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 9:18:00 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.46	1049.44	1010.00	103.90
PFBS_2	298.9 / 99.0	1.46	949.09	1010.00	93.97
PFHxA_1	313.0 / 269.0	1.77	1000.35	1010.00	99.05
PFHxA_2	313.0 / 119.0	1.77	1085.92	1010.00	107.52
PFHpA_1	363.0 / 319.0	2.18	932.15	1000.00	93.21
PFHpA_2	363.0 / 169.0	2.18	875.57	1000.00	87.56
PFHxS_1	399.0 / 80.0	2.20	1028.46	1010.00	101.83
PFHxS_2	399.0 / 99.0	2.21	1018.96	1010.00	100.89
PFOA_1	413.0 / 369.0	2.59	989.66	1000.00	98.97
PFOA_2	413.0 / 169.0	2.59	907.87	1000.00	90.79
PFNA_1	463.0 / 419.0	2.98	1030.62	1000.00	103.06
PFNA_2	463.0 / 219.0	2.98	952.75	1000.00	95.28
PFOS_1	499.0 / 80.0	2.98	959.63	1010.00	95.01
PFOS_2	499.0 / 99.0	2.98	969.99	1010.00	96.04
PFDA_1	513.0 / 469.0	3.34	933.52	1000.00	93.35
PFDA_2	513.0 / 219.0	3.34	984.63	1000.00	98.46
PFUnA_1	563.0 / 519.0	3.66	925.83	1000.00	92.58
PFUnA_2	563.0 / 269.0	3.66	929.01	1000.00	92.90
PFDoA_1	613.0 / 569.0	3.95	1062.82	1000.00	106.28
PFDoA_2	613.0 / 319.0	3.95	1036.49	1000.00	103.65
PFTrDA_1	663.0 / 619.0	4.19	1050.26	1000.00	105.03
PFTrDA_2	663.0 / 169.0	4.19	1015.21	1000.00	101.52
PFTeDA_1	713.0 / 669.0	4.41	1092.17	1000.00	109.22
PFTeDA_2	713.0 / 169.0	4.41	1036.68	1000.00	103.67
NMeFOSAA_1	570.0 / 419.0	3.50	875.58	1000.00	87.56
NMeFOSAA_2	570.0 / 512.0	3.50	926.31	1000.00	92.63
NEtFOSAA_1	584.0 / 419.0	3.66	949.89	1000.00	94.99
NEtFOSAA_2	584.0 / 483.0	3.66	975.09	1000.00	97.51
HFPO-DA_1	285.0 / 169.0	1.89	990.01	1000.00	99.00
HFPO-DA_2	285.0 / 118.8	1.89	968.99	1000.00	96.90
ADONA_1	377.0 / 251.0	2.22	1082.56	1000.00	108.26
ADONA_2	377.0 / 85.0	2.22	1090.02	1000.00	109.00
9Cl-PF3ONS_1	531.0 / 351.0	3.18	985.63	932.00	105.75
9Cl-PF3ONS_2	531.0 / 83.0	3.18	1030.29	932.00	110.55
11Cl-pf3OUdS_1	631.0 / 451.0	3.80	976.55	942.00	103.67
11Cl-pf3OUdS_2	631.0 / 83.0	3.79	681.06	942.00	72.30

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	8
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 10:01:09 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.46	2492.54	2525.00	98.71
PFBS_2	298.9 / 99.0	1.46	2509.18	2525.00	99.37
PFHxA_1	313.0 / 269.0	1.78	2467.79	2525.00	97.73
PFHxA_2	313.0 / 119.0	1.77	2524.95	2525.00	100.00
PFHpA_1	363.0 / 319.0	2.18	2296.66	2500.00	91.87
PFHpA_2	363.0 / 169.0	2.18	2409.45	2500.00	96.38
PFHxS_1	399.0 / 80.0	2.20	2184.75	2525.00	86.52
PFHxS_2	399.0 / 99.0	2.20	2216.84	2525.00	87.80
PFOA_1	413.0 / 369.0	2.59	2395.17	2500.00	95.81
PFOA_2	413.0 / 169.0	2.59	2321.37	2500.00	92.85
PFNA_1	463.0 / 419.0	2.98	2414.73	2500.00	96.59
PFNA_2	463.0 / 219.0	2.98	2328.55	2500.00	93.14
PFOS_1	499.0 / 80.0	2.98	2241.02	2525.00	88.75
PFOS_2	499.0 / 99.0	2.97	2310.63	2525.00	91.51
PFDA_1	513.0 / 469.0	3.33	2257.68	2500.00	90.31
PFDA_2	513.0 / 219.0	3.33	2225.95	2500.00	89.04
PFUnA_1	563.0 / 519.0	3.65	2500.19	2500.00	100.01
PFUnA_2	563.0 / 269.0	3.65	2376.50	2500.00	95.06
PFDoA_1	613.0 / 569.0	3.94	2619.26	2500.00	104.77
PFDoA_2	613.0 / 319.0	3.94	2479.28	2500.00	99.17
PFTrDA_1	663.0 / 619.0	4.18	2391.54	2500.00	95.66
PFTrDA_2	663.0 / 169.0	4.18	2328.87	2500.00	93.15
PFTeDA_1	713.0 / 669.0	4.40	2495.17	2500.00	99.81
PFTeDA_2	713.0 / 169.0	4.40	2437.28	2500.00	97.49
NMeFOSAA_1	570.0 / 419.0	3.49	2554.24	2500.00	102.17
NMeFOSAA_2	570.0 / 512.0	3.49	2441.95	2500.00	97.68
NEtFOSAA_1	584.0 / 419.0	3.65	2587.53	2500.00	103.50
NEtFOSAA_2	584.0 / 483.0	3.65	2308.64	2500.00	92.35
HFPO-DA_1	285.0 / 169.0	1.89	2414.48	2500.00	96.58
HFPO-DA_2	285.0 / 118.8	1.89	2394.34	2500.00	95.77
ADONA_1	377.0 / 251.0	2.22	2217.79	2500.00	88.71
ADONA_2	377.0 / 85.0	2.22	2369.71	2500.00	94.79
9Cl-PF3ONS_1	531.0 / 351.0	3.18	2321.95	2330.00	99.65
9Cl-PF3ONS_2	531.0 / 83.0	3.17	2411.14	2330.00	103.48
11Cl-pf3OUdS_1	631.0 / 451.0	3.79	2425.69	2355.00	103.00
11Cl-pf3OUdS_2	631.0 / 83.0	3.79	2179.43	2355.00	92.54

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	8
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 10:55:48 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
PFBS_1	298.9 / 80.0	1.45	2596.07	2525.00	102.81
PFBS_2	298.9 / 99.0	1.45	2568.03	2525.00	101.70
PFHxA_1	313.0 / 269.0	1.76	2415.79	2525.00	95.68
PFHxA_2	313.0 / 119.0	1.76	2357.05	2525.00	93.35
PFHpA_1	363.0 / 319.0	2.17	2385.68	2500.00	95.43
PFHpA_2	363.0 / 169.0	2.17	2187.46	2500.00	87.50
PFHxS_1	399.0 / 80.0	2.19	2085.04	2525.00	82.58
PFHxS_2	399.0 / 99.0	2.19	2087.40	2525.00	82.67
PFOA_1	413.0 / 369.0	2.58	2437.99	2500.00	97.52
PFOA_2	413.0 / 169.0	2.58	2338.03	2500.00	93.52
PFNA_1	463.0 / 419.0	2.97	2298.24	2500.00	91.93
PFNA_2	463.0 / 219.0	2.97	2293.53	2500.00	91.74
PFOS_1	499.0 / 80.0	2.97	1999.25	2525.00	79.18
PFOS_2	499.0 / 99.0	2.97	1998.64	2525.00	79.15
PFDA_1	513.0 / 469.0	3.33	2160.43	2500.00	86.42
PFDA_2	513.0 / 219.0	3.33	2142.49	2500.00	85.70
PFUnA_1	563.0 / 519.0	3.65	2232.26	2500.00	89.29
PFUnA_2	563.0 / 269.0	3.65	1928.82	2500.00	77.15
PFDoA_1	613.0 / 569.0	3.93	2637.70	2500.00	105.51
PFDoA_2	613.0 / 319.0	3.93	2522.77	2500.00	100.91
PFTrDA_1	663.0 / 619.0	4.18	2538.28	2500.00	101.53
PFTrDA_2	663.0 / 169.0	4.18	2476.53	2500.00	99.06
PFTeDA_1	713.0 / 669.0	4.39	2598.38	2500.00	103.94
PFTeDA_2	713.0 / 169.0	4.39	2579.98	2500.00	103.20
NMeFOSAA_1	570.0 / 419.0	3.49	2735.51	2500.00	109.42
NMeFOSAA_2	570.0 / 512.0	3.48	2664.67	2500.00	106.59
NEtFOSAA_1	584.0 / 419.0	3.65	2778.69	2500.00	111.15
NEtFOSAA_2	584.0 / 483.0	3.65	2533.48	2500.00	101.34
HFPO-DA_1	285.0 / 169.0	1.88	2552.54	2500.00	102.10
HFPO-DA_2	285.0 / 118.8	1.88	2406.30	2500.00	96.25
ADONA_1	377.0 / 251.0	2.21	2114.54	2500.00	84.58
ADONA_2	377.0 / 85.0	2.21	2180.20	2500.00	87.21
9Cl-PF3ONS_1	531.0 / 351.0	3.17	2248.35	2330.00	96.50
9Cl-PF3ONS_2	531.0 / 83.0	3.17	2045.95	2330.00	87.81
11Cl-pf3OUdS_1	631.0 / 451.0	3.78	2334.65	2355.00	99.14
11Cl-pf3OUdS_2	631.0 / 83.0	3.78	2031.20	2355.00	86.25

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QC Summary Report

Created with Analyst Reporter
Printed: 04/09/2019 12:43:20 PM

Sample Name	KP89 ICC	**Injection Vial**	13
Sample ID	ICC	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 1:52:33 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.94	224.86	250.00	89.94
d3-MeFOSAA	573.0 / 419.0	3.49	246.27	250.00	98.51
d5-EtFOSAA	589.0 / 419.0	3.65	244.67	250.00	97.87
13C5-PFHxA	318.0 / 273.0	1.77	238.14	250.00	95.26
13C4-PFHpA	367.0 / 322.0	2.18	247.14	250.00	98.86
13C8-PFOA	421.0 / 376.0	2.59	252.36	250.00	100.94
13C9-PFNA	472.0 / 427.0	2.98	256.15	250.00	102.46
13C6-PFDA	519.0 / 474.0	3.33	235.49	250.00	94.20
13C7-PFUnA	570.0 / 525.0	3.65	248.20	250.00	99.28
13C2-PFTeDA	715.0 / 670.0	4.41	231.51	250.00	92.61
13C3-PFBS	302.0 / 99.0	1.46	222.49	232.25	95.80
13C3-PFHxS	402.0 / 99.0	2.20	232.72	236.50	98.40
13C8-PFOS	507.0 / 99.0	2.98	256.12	239.25	107.05
13C3-HFPO-DA	287.0 / 169.0	1.89	233.52	250.00	93.41

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	28
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 4:24:03 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.93	236.75	250.00	94.70
d3-MeFOSAA	573.0 / 419.0	3.48	243.47	250.00	97.39
d5-EtFOSAA	589.0 / 419.0	3.64	234.96	250.00	93.99
13C5-PFHxA	318.0 / 273.0	1.76	224.30	250.00	89.72
13C4-PFHpA	367.0 / 322.0	2.17	231.81	250.00	92.73
13C8-PFOA	421.0 / 376.0	2.58	239.68	250.00	95.87
13C9-PFNA	472.0 / 427.0	2.97	228.47	250.00	91.39
13C6-PFDA	519.0 / 474.0	3.32	251.13	250.00	100.45
13C7-PFUnA	570.0 / 525.0	3.64	240.77	250.00	96.31
13C2-PFTeDA	715.0 / 670.0	4.39	231.66	250.00	92.66
13C3-PFBS	302.0 / 99.0	1.44	231.13	232.25	99.52
13C3-PFHxS	402.0 / 99.0	2.20	234.15	236.50	99.01
13C8-PFOS	507.0 / 99.0	2.97	202.96	239.25	84.83
13C3-HFPO-DA	287.0 / 169.0	1.88	226.43	250.00	90.57

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QC Summary Report

Sample Name	KP84 CCV	**Injection Vial**	4
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 9:18:00 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.94	242.42	250.00	96.97
d3-MeFOSAA	573.0 / 419.0	3.49	261.47	250.00	104.59
d5-EtFOSAA	589.0 / 419.0	3.65	263.12	250.00	105.25
13C5-PFHxA	318.0 / 273.0	1.76	253.03	250.00	101.21
13C4-PFHpA	367.0 / 322.0	2.17	273.65	250.00	109.46
13C8-PFOA	421.0 / 376.0	2.58	257.61	250.00	103.05
13C9-PFNA	472.0 / 427.0	2.97	251.72	250.00	100.69
13C6-PFDA	519.0 / 474.0	3.33	262.94	250.00	105.18
13C7-PFUnA	570.0 / 525.0	3.65	261.39	250.00	104.55
13C2-PFTeDA	715.0 / 670.0	4.41	246.98	250.00	98.79
13C3-PFBS	302.0 / 99.0	1.45	217.01	232.25	93.44
13C3-PFHxS	402.0 / 99.0	2.20	219.32	236.50	92.73
13C8-PFOS	507.0 / 99.0	2.97	227.52	239.25	95.10
13C3-HFPO-DA	287.0 / 169.0	1.89	251.43	250.00	100.57

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	8
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 10:01:09 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.93	253.49	250.00	101.40
d3-MeFOSAA	573.0 / 419.0	3.48	263.96	250.00	105.58
d5-EtFOSAA	589.0 / 419.0	3.65	276.73	250.00	110.69
13C5-PFHxA	318.0 / 273.0	1.76	243.28	250.00	97.31
13C4-PFHpA	367.0 / 322.0	2.17	254.20	250.00	101.68
13C8-PFOA	421.0 / 376.0	2.58	256.79	250.00	102.71
13C9-PFNA	472.0 / 427.0	2.97	251.06	250.00	100.42
13C6-PFDA	519.0 / 474.0	3.32	266.27	250.00	106.51
13C7-PFUnA	570.0 / 525.0	3.64	252.60	250.00	101.04
13C2-PFTeDA	715.0 / 670.0	4.39	258.44	250.00	103.38
13C3-PFBS	302.0 / 99.0	1.44	245.32	232.25	105.63
13C3-PFHxS	402.0 / 99.0	2.19	278.81	236.50	117.89
13C8-PFOS	507.0 / 99.0	2.97	272.12	239.25	113.74
13C3-HFPO-DA	287.0 / 169.0	1.88	244.74	250.00	97.90

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QC Summary Report

Sample Name	KP85 CCV	**Injection Vial**	8
Sample ID	CCV	**Injection Volume**	10.00
Sample Type	Quality Control	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 10:55:48 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Conc. (ng/L)	Target Conc. (ng/L)	Recovery (%)
13C2-PFDoA	615.0 / 570.0	3.92	251.55	250.00	100.62
d3-MeFOSAA	573.0 / 419.0	3.48	212.91	250.00	85.16
d5-EtFOSAA	589.0 / 419.0	3.64	231.62	250.00	92.65
13C5-PFHxA	318.0 / 273.0	1.75	263.25	250.00	105.30
13C4-PFHpA	367.0 / 322.0	2.16	255.89	250.00	102.36
13C8-PFOA	421.0 / 376.0	2.57	252.24	250.00	100.90
13C9-PFNA	472.0 / 427.0	2.96	264.77	250.00	105.91
13C6-PFDA	519.0 / 474.0	3.32	260.42	250.00	104.17
13C7-PFUnA	570.0 / 525.0	3.63	278.08	250.00	111.23
13C2-PFTeDA	715.0 / 670.0	4.39	242.16	250.00	96.86
13C3-PFBS	302.0 / 99.0	1.44	219.88	232.25	94.67
13C3-PFHxS	402.0 / 99.0	2.19	275.24	236.50	116.38
13C8-PFOS	507.0 / 99.0	2.96	270.65	239.25	113.13
13C3-HFPO-DA	287.0 / 169.0	1.88	248.79	250.00	99.52

PHILADELPHIA
SDG 19-0746

PFAS Concentration = *[(PA - b)/m] * C_{IS} * PIV * DF/S*

Where:

PA	Area of target analyte/ area of internal standard
b	y Intercept from calibration curve
C_{IS}	Concentration of internal standard (ng/L)
m	Slope of calibration
DF	Dilution factor
S	Sample Size
PIV	Pre-injection volume (L)

Target Analyte	PFHxS
Sample ID	NSP-MW-07-20190812
Sample Size (L)	0.26
Dilution Factor	3125
PIV (L)	0.001
PFHxS Area	1464226.1
IS Area	22490.61
IS Amount (ng/L)	236.5
Calibration Curve	y =3.84045 x + 0.02138
Concentration (ng/L)	48171.48
Reported Concentration (ng/L)	48171.51

Surrgoate Concentration = *[(PA)/m] * C_{IS}*

Where:

PA	Area of target analyte/ area of internal standard
C_{IS}	Concentration of internal standard (ng/L)
m	Slope of calibration
Surrogate spike amount	238.75

Surrogate	13C3-PFHxS
Sample ID	NSP-MW-07-20190812
13C3-PFHxS Area	21495.62
IS Area	31320.31
IS Amount (ng/L)	238.75
Calibration Curve	y = 1.00811 x
Concentration (ng/L)	162.54
ng/ml	0.162539673

PIV	1	ml
Sample Size	0.26	L
Final Concentration	0.63	ng/L
Spike Concentration	0.238	ng
Sample Spike Concentration	0.92	ng/L
Calculated Surrogate %R	0.63/0.92*100	68.47826087
Reported Surrogate %R	69	

PFAS Concentration = *[(PA - b)/m] * C_{IS} * PIV * DF/S*

Where:

PA	Area of target analyte/ area of internal standard
b	y Intercept from calibration curve
C_{IS}	Concentration of internal standard (ng/L)
m	Slope of calibration
DF	Dilution factor
S	Sample Size
PIV	Pre-injection volume (L)

Target Analyte	PFHxS
Sample ID	NSP-MW-04-20190812
Sample Size (L)	0.27
Dilution Factor	5
PIV (L)	0.001
PFHxS Area	6858445.97
IS Area	23239.05
IS Amount (ng/L)	236.5
Calibration Curve	y =3.84045 x + 0.02138
Concentration (ng/L)	336.54
Reported Concentration (ng/L)	336.54

Surrgoate Concentration = *[(PA)/m] * C_{IS}*

Where:

PA	Area of target analyte/ area of internal standard
C_{IS}	Concentration of internal standard (ng/L)
m	Slope of calibration
Surrogate spike amount	238.75

Surrogate	13C3-PFHxS
Sample ID	NSP-MW-04-20190812
13C3-PFHxS Area	23239.05
IS Area	30887.29
IS Amount (ng/L)	238.75
Calibration Curve	y = 1.00811 x
Concentration (ng/L)	178.19
ng/ml	0.178186182

PIV	1	ml
Sample Size	0.27	L
Final Concentration	0.66	ng/L
Spike Concentration	0.238	ng
Sample Spike Concentration	0.88	ng/L
Calculated Surrogate %R	0.66/0.88*100	75
Reported Surrogate %R	75	

LABORATORY CONTROL SAMPLE

	Result	Target	Calculation	Recovery	Reported Recovery	QC Limits
PFHxS	18.20 ng/L	20.20 ng/L	18.20/20.20*100	90.10	90	52-128

ICC RECOVERY (%)	Result	Target	Calculation	Recovery	Reported Recovery
KP89					
PFHxS	1044.03 ng/L	1010.00 ng/L	1044.038/1010*100	103.37	103.37

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

NSP-MW-04-20190812 336.54 ng/L	Result	Target	Calculation	Recovery	Reported Recovery	QC Limits	RPD	Reported RPD	RPD Limit
PFHxS MS	367.02	36.73	(367.02-336.54)/36.73*100	82.98	83	52-128	NA		
PFHxS MSD	361.3	37.41	(361.3-336.54)/37.41*100	66.19	66	52-128	22.8188	22.8	30

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PFAS Sample Quant Report

Created with Analyst Reporter
Printed: 04/09/2019 2:17:57 PM

Sample Name	I6200-FS-D(13)	**Injection Vial**	1
Sample ID	NSP-MW-07-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/4/2019 10:45:00 AM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	N/A	N/A	N/A	N/A	True	13C3-PFBS	27375.00	232.25	PFBS			
PFBS_2	298.9 / 99.0	N/A	N/A	N/A	N/A	True	13C3-PFBS	27375.00	232.25	PFBS	N/A	0.309	✓
PFHxA_1	313.0 / 269.0	1.77	2443191.76	6008.81	250.1	False	13C5-PFHxA	106439.04	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.77	150641.46	5110.48	243.7	False	13C5-PFHxA	106439.04	250.00	PFHxA	0.062	0.076	✓
PFHpA_1	363.0 / 319.0	N/A	N/A	N/A	N/A	True	13C4-PFHpA	123157.47	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	N/A	N/A	N/A	N/A	True	13C4-PFHpA	123157.47	250.00	PFHpA	N/A	0.024	✓
PFHxS_1	399.0 / 80.0	2.20	1464226.10	4007.87	647.6	False	13C3-PFHxS	22490.61	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.20	416292.31	3997.41	968.7	False	13C3-PFHxS	22490.61	236.50	PFHxS	0.284	0.294	✓
PFOA_1	413.0 / 369.0	2.58	1200619.01	2422.70	435.5	False	13C8-PFOA	119876.46	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.57	68521.96	1818.63	266.3	True	13C8-PFOA	119876.46	250.00	PFOA	0.057	0.076	✓
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	118188.97	250.00	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	118188.97	250.00	PFNA	N/A	0.273	✓
PFOS_1	499.0 / 80.0	N/A	N/A	N/A	N/A	True	13C8-PFOS	22116.11	239.25	PFOS			
PFOS_2	499.0 / 99.0	N/A	N/A	N/A	N/A	True	13C8-PFOS	22116.11	239.25	PFOS	N/A	0.177	✓
PFDA_1	513.0 / 469.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	135814.25	250.00	PFDA			
PFDA_2	513.0 / 219.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	135814.25	250.00	PFDA	N/A	0.045	✓
PFUnA_1	563.0 / 519.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	150069.96	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	150069.96	250.00	PFUnA	N/A	0.054	✓
PFDoA_1	613.0 / 569.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	133943.93	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	133943.93	250.00	PFDoA	N/A	0.159	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	118652.53	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	118652.53	250.00	PFTrDA	N/A	0.073	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	118652.53	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	118652.53	250.00	PFTeDA	N/A	0.053	✓
NMeFOSAA_1	570.0 / 419.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	19796.26	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	19796.26	250.00	NMeFOSAA	N/A	0.590	✓
NEtFOSAA_1	584.0 / 419.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	25789.50	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	25789.50	250.00	NEtFOSAA	N/A	0.055	✓
HFPO-DA_1	285.0 / 169.0	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	87935.61	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	87935.61	250.00	HFPO-DA	N/A	0.027	✓
ADONA_1	377.0 / 251.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	22490.61	236.50	ADONA			
ADONA_2	377.0 / 85.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	22490.61	236.50	ADONA	N/A	0.014	✓
9Cl-PF3ONS_1	531.0 / 351.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	118188.97	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	118188.97	250.00	9Cl-PF3ONS	N/A	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	133943.93	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	133943.93	250.00	11Cl-PF3OUdS	N/A	0.005	✓

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PFAS Sample Quant Report

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Sample Name	I6200-FS-D(7)	**Injection Vial**	26
Sample ID	NSP-MW-07-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 4:13:16 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C2-PFDoA	615.0 / 570.0	3.93	133571.49	181.34	1125.7	False	13C2-PFDA	168769.11	250.00				
d3-MeFOSAA	573.0 / 419.0	3.49	19876.09	172.51	352.8	False	13C4-PFOS	31320.31	238.75		N/A	N/A	✓
d5-EtFOSAA	589.0 / 419.0	3.65	22739.32	170.30	243.5	False	13C4-PFOS	31320.31	238.75		N/A	N/A	✓
13C5-PFHxA	318.0 / 273.0	1.76	77092.29	73.57	142.0	True	13C2-PFOA	256263.12	250.00		N/A	N/A	✓
13C4-PFHpA	367.0 / 322.0	2.17	94626.93	81.08	379.0	False	13C2-PFOA	256263.12	250.00		N/A	N/A	✓
13C8-PFOA	421.0 / 376.0	2.58	116034.67	100.82	622.0	False	13C2-PFOA	256263.12	250.00		N/A	N/A	✓
13C9-PFNA	472.0 / 427.0	2.97	131134.29	113.94	634.8	False	13C2-PFOA	256263.12	250.00		N/A	N/A	✓
13C6-PFDA	519.0 / 474.0	3.33	125054.70	181.76	705.9	False	13C2-PFDA	168769.11	250.00		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.0	3.64	136513.08	188.09	683.1	False	13C2-PFDA	168769.11	250.00		N/A	N/A	✓
13C2-PFTeDA	715.0 / 670.0	4.40	123918.63	185.47	2657.3	False	13C2-PFDA	168769.11	250.00		N/A	N/A	✓
13C3-PFBS	302.0 / 99.0	1.44	25665.86	159.91	169.6	False	13C4-PFOS	31320.31	238.75		N/A	N/A	✓
13C3-PFHxS	402.0 / 99.0	2.19	21495.62	162.54	203.4	False	13C4-PFOS	31320.31	238.75		N/A	N/A	✓
13C8-PFOS	507.0 / 99.0	2.97	21919.04	165.91	279.3	False	13C4-PFOS	31320.31	238.75		N/A	N/A	✓
13C3-HFPO-DA	287.0 / 169.0	1.88	83938.03	94.75	366.6	False	13C2-PFOA	256263.12	250.00		N/A	N/A	✓

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PFAS Sample Quant Report

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Sample Name	I6199-FS-D(11)	**Injection Vial**	18
Sample ID	NSP-MW-04-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 2:46:59 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.46	919444.54	3688.38	162.5	False	13C3-PFBS	21957.08	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.46	229513.50	2979.48	208.9	False	13C3-PFBS	21957.08	232.25	PFBS	0.250	0.309	✓
PFHxA_1	313.0 / 269.0	1.78	6858770.90	19102.15	145.8	False	13C5-PFHxA	94231.35	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.78	470204.45	18139.62	322.0	False	13C5-PFHxA	94231.35	250.00	PFHxA	0.069	0.076	✓
PFHpA_1	363.0 / 319.0	2.19	4324897.81	11394.33	183.9	False	13C4-PFHpA	103865.05	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.18	105499.46	12953.13	291.0	False	13C4-PFHpA	103865.05	250.00	PFHpA	0.024	0.024	✓
PFHxS_1	399.0 / 80.0	2.21	6858445.97	18172.95	439.6	False	13C3-PFHxS	23239.05	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.21	1933185.47	18022.79	817.5	False	13C3-PFHxS	23239.05	236.50	PFHxS	0.282	0.294	✓
PFOA_1	413.0 / 369.0	2.59	7144405.54	15394.51	291.5	False	13C8-PFOA	112857.53	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.59	508326.38	14454.60	511.8	True	13C8-PFOA	112857.53	250.00	PFOA	0.071	0.076	✓
PFNA_1	463.0 / 419.0	2.98	3504064.93	7686.41	460.4	False	13C9-PFNA	111772.88	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.98	942653.56	7621.26	621.6	False	13C9-PFNA	111772.88	250.00	PFNA	0.269	0.273	✓
PFOS_1	499.0 / 80.0	2.87	2377635.47	6388.52	225.7	False	13C8-PFOS	19520.93	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.97	338083.37	5005.67	353.5	False	13C8-PFOS	19520.93	239.25	PFOS	0.142	0.177	✓
PFDA_1	513.0 / 469.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	114939.61	250.00	PFDA			
PFDA_2	513.0 / 219.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	114939.61	250.00	PFDA	N/A	0.045	✓
PFUnA_1	563.0 / 519.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	118748.81	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	118748.81	250.00	PFUnA	N/A	0.054	✓
PFDoA_1	613.0 / 569.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	116303.16	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	116303.16	250.00	PFDoA	N/A	0.159	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	101740.72	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	101740.72	250.00	PFTrDA	N/A	0.073	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	101740.72	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	101740.72	250.00	PFTeDA	N/A	0.053	✓
NMeFOSAA_1	570.0 / 419.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	13997.74	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	13997.74	250.00	NMeFOSAA	N/A	0.590	✓
NEtFOSAA_1	584.0 / 419.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	21583.97	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	21583.97	250.00	NEtFOSAA	N/A	0.055	✓
HFPO-DA_1	285.0 / 169.0	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	67738.53	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	67738.53	250.00	HFPO-DA	N/A	0.027	✓
ADONA_1	377.0 / 251.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	23239.05	236.50	ADONA			
ADONA_2	377.0 / 85.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	23239.05	236.50	ADONA	N/A	0.014	✓
9Cl-PF3ONS_1	531.0 / 351.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	111772.88	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	111772.88	250.00	9Cl-PF3ONS	N/A	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	116303.16	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	116303.16	250.00	11Cl-PF3OUdS	N/A	0.005	✓

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PFAS Sample Quant Report

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Sample Name	I6199-FS-D(11)	**Injection Vial**	18
Sample ID	NSP-MW-04-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/3/2019 2:46:59 PM	**Data File**	AC_09032019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746A_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
13C2-PFDoA	615.0 / 570.0	3.93	116303.16	171.13	1172.5	False	13C2-PFDA	155722.85	250.00				
d3-MeFOSAA	573.0 / 419.0	3.49	14301.17	125.87	217.0	True	13C4-PFOS	30887.29	238.75		N/A	N/A	✓
d5-EtFOSAA	589.0 / 419.0	3.65	21194.08	160.95	262.3	False	13C4-PFOS	30887.29	238.75		N/A	N/A	✓
13C5-PFHxA	318.0 / 273.0	1.77	94231.35	156.40	117.9	False	13C2-PFOA	147334.90	250.00		N/A	N/A	✓
13C4-PFHpA	367.0 / 322.0	2.18	103865.05	154.78	349.3	False	13C2-PFOA	147334.90	250.00		N/A	N/A	✓
13C8-PFOA	421.0 / 376.0	2.59	112857.53	170.56	506.2	False	13C2-PFOA	147334.90	250.00		N/A	N/A	✓
13C9-PFNA	472.0 / 427.0	2.97	111772.88	168.91	447.6	False	13C2-PFOA	147334.90	250.00		N/A	N/A	✓
13C6-PFDA	519.0 / 474.0	3.33	114939.61	181.05	730.6	False	13C2-PFDA	155722.85	250.00		N/A	N/A	✓
13C7-PFUnA	570.0 / 525.0	3.65	118748.81	177.32	756.1	False	13C2-PFDA	155722.85	250.00		N/A	N/A	✓
13C2-PFTeDA	715.0 / 670.0	4.40	101740.72	165.03	2400.6	False	13C2-PFDA	155722.85	250.00		N/A	N/A	✓
13C3-PFBS	302.0 / 99.0	1.45	21957.08	138.72	179.6	False	13C4-PFOS	30887.29	238.75		N/A	N/A	✓
13C3-PFHxS	402.0 / 99.0	2.20	23239.05	178.19	201.2	False	13C4-PFOS	30887.29	238.75		N/A	N/A	✓
13C8-PFOS	507.0 / 99.0	2.97	19520.93	149.83	151.0	False	13C4-PFOS	30887.29	238.75		N/A	N/A	✓
13C3-HFPO-DA	287.0 / 169.0	1.89	67738.53	132.99	289.3	False	13C2-PFOA	147334.90	250.00		N/A	N/A	✓

Example Calculation for PFAS

Calculation of final concentration from area:

$$Concentration = \left[\frac{PA - b}{m}\right] * C_{IS} * PIV * DF/S$$

Where:

PA = Area of target / area of internal standard
b = y intercept from calibration curve
CIS = concentration of internal standard (ng/L)
m = slope of calibration
DF = dilution factor
S = Sample Size
PIV = Pre-injection volume (L)

Sample ID:	I6197-FS-D(3)
Client Sample ID:	NSP-MW-02-20190812
Sample Size:	0.26
Units:	L
Dilution Factor:	16.667
PIV (L):	0.001
Target Analyte:	PFOS
MRM Transition:	499.0 / 80.0
Data file:	AC_09012019_5-369.wiff
Result table:	19-0746
Area:	9,206,333.58
IS Name:	13C8-PFOS
IS Area:	35,235.87
IS Amount (ng/L):	239.25
y-intercept:	0.03296
slope:	4.80682

$$\text{Concentration} = \frac{[(9206333.58/35235.87) - 0.03296]}{4.80682} * 239.25 * 0.001 * 16.667 / 0.26$$

ng/L = 833.54

*Final concentration may vary based on rounding.

Philadelphia
SDG 19-0746

INTIAL CALIBRATION (IC) LINEAR REGRESSION W/ INTERNAL STANDARD & SAMPLE CALCULATION

SAMPLE NSP-DUP-01-20190812

PFOA- 09/01/2019
13C8-PFOA (IS) CONCENTRATION = 250

CONCENTRATION (IC CONC/IS CONC)	RESPONSE FACTOR (RF=IC/IS)	IC STANDARD	IS RESPONSE	RF	IC CONC	IC CONC/IS CONC
100	0.478864087	64821.26	135364.63	0.478864087	100	1
250	1.173494229	162521.1	138493.31	1.173494229	250	2.5
500	2.27656628	305116.09	134024.69	2.27656628	500	5
1000	4.21408172	599298.51	142213.31	4.21408172	1000	10
2500	10.04905482	1438143.85	143112.35	10.04905482	25000	250
10000	39.65043276	5384321	135794.76	39.65043276	10000	100
20000	81.63605988	11190789.46	137081.45	81.63605988	20000	200

CORREL
0.999891171
Y-INTERCEPT
0.013924006
SLOPE
0.004057674

SAMPLE RESPONSE	6105115.1
IS RESPONSE	193953.49
PFOA RESPONSE	31.4772119
ALIQUOT	0.265 L
DILUTION	10

FINAL CONCENTRATION 292.6046 ng/L **REPORTED RESULT** 293.17 ng/L

SAMPLE NSP-MW-08-20190812 PFOA

SAMPLE RESPONSE	1922962.85
IS RESPONSE	186058
PFOA RESPONSE	10.3352871
ALIQUOT	0.28 L
DILUTION	10

FINAL CONCENTRATION 90.8452 ng/L **REPORTED RESULT** 90.4 ng/L

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PFAS Sample Quant Report

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Printed: 04/09/2019 2:18:03 PM

Sample Name	I6202-FS-D(3)	**Injection Vial**	8
Sample ID	NSP-DUP-01-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 12:02:50 PM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.44	1173523.20	2267.67	192.7	False	13C3-PFBS	42466.99	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.44	313686.19	1992.80	303.5	False	13C3-PFBS	42466.99	232.25	PFBS	0.267	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	4275638.62	7368.49	116.0	False	13C5-PFHxA	151634.58	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	276225.96	6463.44	180.6	False	13C5-PFHxA	151634.58	250.00	PFHxA	0.065	0.073	✓
PFHpA_1	363.0 / 319.0	2.15	2516025.49	3872.52	135.6	False	13C4-PFHpA	180630.49	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.09	139387.75	9788.29	258.0	False	13C4-PFHpA	180630.49	250.00	PFHpA	0.055	0.025	
PFHxS_1	399.0 / 80.0	2.18	10125872.47	14274.21	531.6	False	13C3-PFHxS	40465.57	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.18	2819902.59	14468.70	992.6	False	13C3-PFHxS	40465.57	236.50	PFHxS	0.278	0.285	✓
PFOA_1	413.0 / 369.0	2.57	6105115.10	7768.89	368.9	False	13C8-PFOA	193953.49	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.56	377140.95	6388.47	413.1	True	13C8-PFOA	193953.49	250.00	PFOA	0.062	0.074	✓
PFNA_1	463.0 / 419.0	2.96	1918572.52	2565.01	321.9	False	13C9-PFNA	182824.46	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.95	542344.73	2653.47	331.6	False	13C9-PFNA	182824.46	250.00	PFNA	0.283	0.279	✓
PFOS_1	499.0 / 80.0	2.94	23396433.18	35622.55	437.6	False	13C8-PFOS	32688.79	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.95	4046893.70	34516.95	758.5	False	13C8-PFOS	32688.79	239.25	PFOS	0.173	0.187	✓
PFDA_1	513.0 / 469.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	189432.33	250.00	PFDA			
PFDA_2	513.0 / 219.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	189432.33	250.00	PFDA	N/A	0.045	✓
PFUnA_1	563.0 / 519.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	187963.35	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	187963.35	250.00	PFUnA	N/A	0.050	✓
PFDoA_1	613.0 / 569.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	194554.13	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	194554.13	250.00	PFDoA	N/A	0.162	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	185799.04	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	185799.04	250.00	PFTrDA	N/A	0.075	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	185799.04	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	185799.04	250.00	PFTeDA	N/A	0.052	✓
NMeFOSAA_1	570.0 / 419.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	27330.97	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	27330.97	250.00	NMeFOSAA	N/A	0.566	✓
NEtFOSAA_1	584.0 / 419.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	35283.35	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	35283.35	250.00	NEtFOSAA	N/A	0.052	✓
HFPO-DA_1	285.0 / 169.0	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	121171.84	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	121171.84	250.00	HFPO-DA	N/A	0.029	✓
ADONA_1	377.0 / 251.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	40465.57	236.50	ADONA			
ADONA_2	377.0 / 85.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	40465.57	236.50	ADONA	N/A	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	35283.35	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	35283.35	250.00	9Cl-PF3ONS	N/A	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	194554.13	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	194554.13	250.00	11Cl-PF3OUdS	N/A	0.005	✓

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PFAS Sample Quant Report

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Sample Name	I6201-FS-D(3)	**Injection Vial**	43
Sample ID	NSP-MW-08-20190812	**Injection Volume**	10.00
Sample Type	Unknown	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 8:37:35 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	N/A	N/A	N/A	N/A	True	13C3-PFBS	38097.84	232.25	PFBS			
PFBS_2	298.9 / 99.0	N/A	N/A	N/A	N/A	True	13C3-PFBS	38097.84	232.25	PFBS	N/A	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	2768313.50	5105.01	100.8	False	13C5-PFHxA	141551.97	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	192322.97	4817.02	154.5	False	13C5-PFHxA	141551.97	250.00	PFHxA	0.069	0.073	✓
PFHpA_1	363.0 / 319.0	2.16	1424169.66	2187.25	105.0	False	13C4-PFHpA	180162.06	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.15	35208.30	2408.42	125.3	False	13C4-PFHpA	180162.06	250.00	PFHpA	0.025	0.025	✓
PFHxS_1	399.0 / 80.0	2.19	3137632.63	5277.01	254.3	False	13C3-PFHxS	33971.85	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.19	879719.00	5375.48	545.5	False	13C3-PFHxS	33971.85	236.50	PFHxS	0.280	0.285	✓
PFOA_1	413.0 / 369.0	2.57	1922962.85	2531.32	199.2	False	13C8-PFOA	186058.00	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.56	133605.48	2343.19	217.4	True	13C8-PFOA	186058.00	250.00	PFOA	0.069	0.074	✓
PFNA_1	463.0 / 419.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	176923.90	250.00	PFNA			
PFNA_2	463.0 / 219.0	N/A	N/A	N/A	N/A	True	13C9-PFNA	176923.90	250.00	PFNA	N/A	0.279	✓
PFOS_1	499.0 / 80.0	2.91	4882193.70	7986.69	271.1	False	13C8-PFOS	30419.59	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.96	779894.90	7130.12	595.5	False	13C8-PFOS	30419.59	239.25	PFOS	0.160	0.187	✓
PFDA_1	513.0 / 469.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	177818.84	250.00	PFDA			
PFDA_2	513.0 / 219.0	N/A	N/A	N/A	N/A	True	13C6-PFDA	177818.84	250.00	PFDA	N/A	0.045	✓
PFUnA_1	563.0 / 519.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	177862.90	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	N/A	N/A	N/A	N/A	True	13C7-PFUnA	177862.90	250.00	PFUnA	N/A	0.050	✓
PFDoA_1	613.0 / 569.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	172750.88	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	172750.88	250.00	PFDoA	N/A	0.162	✓
PFTrDA_1	663.0 / 619.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	174426.34	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	174426.34	250.00	PFTrDA	N/A	0.075	✓
PFTeDA_1	713.0 / 669.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	174426.34	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	N/A	N/A	N/A	N/A	True	13C2-PFTeDA	174426.34	250.00	PFTeDA	N/A	0.052	✓
NMeFOSAA_1	570.0 / 419.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	25965.74	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	N/A	N/A	N/A	N/A	True	d3-MeFOSAA	25965.74	250.00	NMeFOSAA	N/A	0.566	✓
NEtFOSAA_1	584.0 / 419.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	32577.28	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	32577.28	250.00	NEtFOSAA	N/A	0.052	✓
HFPO-DA_1	285.0 / 169.0	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	116519.54	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	N/A	N/A	N/A	N/A	True	13C3-HFPO-DA	116519.54	250.00	HFPO-DA	N/A	0.029	✓
ADONA_1	377.0 / 251.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	33971.85	236.50	ADONA			
ADONA_2	377.0 / 85.0	N/A	N/A	N/A	N/A	True	13C3-PFHxS	33971.85	236.50	ADONA	N/A	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	32577.28	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	N/A	N/A	N/A	N/A	True	d5-EtFOSAA	32577.28	250.00	9Cl-PF3ONS	N/A	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	172750.88	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	N/A	N/A	N/A	N/A	True	13C2-PFDoA	172750.88	250.00	11Cl-PF3OUdS	N/A	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP81	**Injection Vial**	2
Sample ID	L1	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:15:13 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.45	40379.98	103.70	650.0	False	13C3-PFBS	30863.67	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.45	13375.75	97.20	273.8	False	13C3-PFBS	30863.67	232.25	PFBS	0.331	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	54109.86	101.77	31.0	False	13C5-PFHxA	118015.15	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	3569.26	92.98	25.3	False	13C5-PFHxA	118015.15	250.00	PFHxA	0.066	0.073	✓
PFHpA_1	363.0 / 319.0	2.16	56246.98	94.38	22.6	True	13C4-PFHpA	132760.21	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.16	1730.00	72.53	17.5	True	13C4-PFHpA	132760.21	250.00	PFHpA	0.031	0.025	✓
PFHxS_1	399.0 / 80.0	2.19	47710.41	111.93	439.9	False	13C3-PFHxS	27614.48	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.18	14783.91	109.42	254.8	False	13C3-PFHxS	27614.48	236.50	PFHxS	0.310	0.285	✓
PFOA_1	413.0 / 369.0	2.57	64821.26	89.55	76.4	False	13C8-PFOA	135364.63	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.57	4467.38	83.45	76.6	False	13C8-PFOA	135364.63	250.00	PFOA	0.069	0.074	✓
PFNA_1	463.0 / 419.0	2.96	63261.10	105.02	122.2	False	13C9-PFNA	142921.26	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.95	18742.55	104.93	90.4	False	13C9-PFNA	142921.26	250.00	PFNA	0.296	0.279	✓
PFOS_1	499.0 / 80.0	2.95	59798.92	107.51	318.5	False	13C8-PFOS	27269.42	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.95	11684.88	96.83	197.9	False	13C8-PFOS	27269.42	239.25	PFOS	0.195	0.187	✓
PFDA_1	513.0 / 469.0	3.31	70226.53	101.90	188.5	False	13C6-PFDA	148661.16	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.31	3633.11	122.82	7722.3	False	13C6-PFDA	148661.16	250.00	PFDA	0.052	0.045	✓
PFUnA_1	563.0 / 519.0	3.62	68244.17	92.67	160.0	False	13C7-PFUnA	160768.72	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	2650.60	106.63	99.0	False	13C7-PFUnA	160768.72	250.00	PFUnA	0.039	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	57284.76	83.76	199.6	False	13C2-PFDoA	148415.07	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	10143.80	85.59	192.6	False	13C2-PFDoA	148415.07	250.00	PFDoA	0.177	0.162	✓
PFTrDA_1	663.0 / 619.0	4.15	51191.22	81.62	208.8	False	13C2-PFTeDA	130952.87	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.15	3217.76	1.85	129.5	False	13C2-PFTeDA	130952.87	250.00	PFTrDA	0.063	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	56589.10	76.98	347.2	False	13C2-PFTeDA	130952.87	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.36	2882.78	76.31	248.4	False	13C2-PFTeDA	130952.87	250.00	PFTeDA	0.051	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.46	11768.02	92.35	519.9	False	d3-MeFOSAA	21817.46	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.46	5083.55	77.09	261.1	False	d3-MeFOSAA	21817.46	250.00	NMeFOSAA	0.432	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	10801.36	99.02	131604.8	False	d5-EtFOSAA	26687.39	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.62	633.05	127.95	320.5	False	d5-EtFOSAA	26687.39	250.00	NEtFOSAA	0.059	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.87	44479.68	92.06	113.2	False	13C3-HFPO-DA	101792.92	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.86	1706.05	98.97	36.4	False	13C3-HFPO-DA	101792.92	250.00	HFPO-DA	0.038	0.029	✓
ADONA_1	377.0 / 251.0	2.20	124795.82	92.16	438.5	False	13C3-PFHxS	27614.48	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.20	1501.03	< 0	197.7	False	13C3-PFHxS	27614.48	236.50	ADONA	0.012	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.15	123424.25	83.02	477.7	False	d5-EtFOSAA	26687.39	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.13	2234.65	178.82	32.1	False	d5-EtFOSAA	26687.39	250.00	9Cl-PF3ONS	0.018	0.009	
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	146896.60	3.96	644.2	False	13C2-PFDoA	148415.07	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.80	654.00	< 0	14.2	False	13C2-PFDoA	148415.07	250.00	11Cl-PF3OUdS	0.004	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP82	**Injection Vial**	3
Sample ID	L2	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:26:01 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.44	96222.89	270.98	710.3	False	13C3-PFBS	28780.14	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.44	33512.28	296.50	457.4	False	13C3-PFBS	28780.14	232.25	PFBS	0.348	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	127606.37	246.01	56.3	False	13C5-PFHxA	126458.44	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	9918.42	264.34	46.3	True	13C5-PFHxA	126458.44	250.00	PFHxA	0.078	0.073	✓
PFHpA_1	363.0 / 319.0	2.16	133837.72	246.53	45.8	True	13C4-PFHpA	138326.51	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.17	4031.43	278.89	42.2	True	13C4-PFHpA	138326.51	250.00	PFHpA	0.030	0.025	✓
PFHxS_1	399.0 / 80.0	2.18	121071.01	259.46	573.0	False	13C3-PFHxS	28048.68	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.18	36634.72	269.47	271.6	False	13C3-PFHxS	28048.68	236.50	PFHxS	0.303	0.285	✓
PFOA_1	413.0 / 369.0	2.57	162521.10	261.63	149.8	False	13C8-PFOA	138493.31	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.57	12764.55	278.60	125.9	False	13C8-PFOA	138493.31	250.00	PFOA	0.079	0.074	✓
PFNA_1	463.0 / 419.0	2.95	162405.29	270.52	228.5	False	13C9-PFNA	145154.17	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.95	44536.34	262.84	168.3	False	13C9-PFNA	145154.17	250.00	PFNA	0.274	0.279	✓
PFOS_1	499.0 / 80.0	2.95	144297.40	277.99	370.0	False	13C8-PFOS	25684.55	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.95	28691.74	288.94	798.3	False	13C8-PFOS	25684.55	239.25	PFOS	0.199	0.187	✓
PFDA_1	513.0 / 469.0	3.31	181322.66	260.55	298.4	False	13C6-PFDA	157541.58	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.31	8288.82	264.84	336.4	False	13C6-PFDA	157541.58	250.00	PFDA	0.046	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	167595.97	261.36	273.6	False	13C7-PFUnA	158891.89	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.62	7643.27	255.56	182.1	False	13C7-PFUnA	158891.89	250.00	PFUnA	0.046	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	153653.98	265.84	343.1	False	13C2-PFDoA	148276.09	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	24889.53	261.40	311.8	False	13C2-PFDoA	148276.09	250.00	PFDoA	0.162	0.162	✓
PFTrDA_1	663.0 / 619.0	4.15	122741.09	251.04	309.0	False	13C2-PFTeDA	131024.37	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.15	9060.50	195.07	240.6	False	13C2-PFTeDA	131024.37	250.00	PFTrDA	0.074	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	142427.03	258.36	543.2	False	13C2-PFTeDA	131024.37	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	7343.75	254.92	502.6	False	13C2-PFTeDA	131024.37	250.00	PFTeDA	0.052	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	25151.75	275.76	1015.9	False	d3-MeFOSAA	19156.55	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.46	15315.80	309.15	1777.0	False	d3-MeFOSAA	19156.55	250.00	NMeFOSAA	0.609	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	25996.13	239.28	567.6	False	d5-EtFOSAA	27399.26	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.62	1363.12	248.31	23542.1	False	d5-EtFOSAA	27399.26	250.00	NEtFOSAA	0.052	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.87	123012.48	275.97	176.8	False	13C3-HFPO-DA	98537.54	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.86	3755.00	278.29	76.4	False	13C3-HFPO-DA	98537.54	250.00	HFPO-DA	0.031	0.029	✓
ADONA_1	377.0 / 251.0	2.20	323907.15	257.41	555.2	False	13C3-PFHxS	28048.68	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.20	6117.52	257.88	302.4	False	13C3-PFHxS	28048.68	236.50	ADONA	0.019	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.15	303140.84	228.66	693.1	False	d5-EtFOSAA	27399.26	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.15	3243.40	263.07	76.2	False	d5-EtFOSAA	27399.26	250.00	9Cl-PF3ONS	0.011	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	387697.48	196.31	988.1	False	13C2-PFDoA	148276.09	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	2028.84	209.76	47.3	False	13C2-PFDoA	148276.09	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP83	**Injection Vial**	4
Sample ID	L3	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:36:46 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.44	178985.02	511.00	1172.0	False	13C3-PFBS	28576.83	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.45	53811.62	492.41	587.8	False	13C3-PFBS	28576.83	232.25	PFBS	0.301	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	247110.69	549.63	80.9	False	13C5-PFHxA	113976.48	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	17688.38	537.31	78.6	False	13C5-PFHxA	113976.48	250.00	PFHxA	0.072	0.073	✓
PFHpA_1	363.0 / 319.0	2.16	252683.59	516.97	67.0	True	13C4-PFHpA	130634.74	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.17	6105.53	504.20	67.1	True	13C4-PFHpA	130634.74	250.00	PFHpA	0.024	0.025	✓
PFHxS_1	399.0 / 80.0	2.18	228507.82	555.63	812.4	False	13C3-PFHxS	24019.78	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.18	63572.07	547.83	421.9	False	13C3-PFHxS	24019.78	236.50	PFHxS	0.278	0.285	✓
PFOA_1	413.0 / 369.0	2.57	305116.09	534.90	240.4	False	13C8-PFOA	134024.69	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.57	23930.57	563.55	231.4	False	13C8-PFOA	134024.69	250.00	PFOA	0.078	0.074	✓
PFNA_1	463.0 / 419.0	2.96	306700.65	514.67	336.6	False	13C9-PFNA	144913.62	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.96	84079.45	508.57	184.1	False	13C9-PFNA	144913.62	250.00	PFNA	0.274	0.279	✓
PFOS_1	499.0 / 80.0	2.96	263347.98	468.62	432.0	False	13C8-PFOS	27872.95	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.96	49371.28	471.47	583.3	False	13C8-PFOS	27872.95	239.25	PFOS	0.187	0.187	✓
PFDA_1	513.0 / 469.0	3.31	339761.99	490.78	482.2	False	13C6-PFDA	159087.92	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.32	12745.40	403.46	458.9	False	13C6-PFDA	159087.92	250.00	PFDA	0.038	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	310486.86	544.33	317.9	False	13C7-PFUnA	147006.87	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	15746.88	533.54	317.5	False	13C7-PFUnA	147006.87	250.00	PFUnA	0.051	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	282123.44	511.58	371.7	False	13C2-PFDoA	147402.60	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	46422.79	521.24	376.4	False	13C2-PFDoA	147402.60	250.00	PFDoA	0.165	0.162	✓
PFTrDA_1	663.0 / 619.0	4.16	234744.49	546.36	455.7	False	13C2-PFTeDA	124314.11	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.16	19180.18	564.07	342.5	False	13C2-PFTeDA	124314.11	250.00	PFTrDA	0.082	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	266946.97	552.03	700.3	False	13C2-PFTeDA	124314.11	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	14221.76	561.15	583.3	False	13C2-PFTeDA	124314.11	250.00	PFTeDA	0.053	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	49339.15	494.65	1553.7	False	d3-MeFOSAA	22077.56	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.47	26817.97	479.31	823.4	False	d3-MeFOSAA	22077.56	250.00	NMeFOSAA	0.544	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	54911.18	524.41	535.3	False	d5-EtFOSAA	26736.81	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.63	2044.17	371.99	433.5	False	d5-EtFOSAA	26736.81	250.00	NEtFOSAA	0.037	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.87	232141.43	520.08	302.3	False	13C3-HFPO-DA	100095.67	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.87	5809.10	446.45	102.7	False	13C3-HFPO-DA	100095.67	250.00	HFPO-DA	0.025	0.029	✓
ADONA_1	377.0 / 251.0	2.20	593672.95	566.98	723.3	False	13C3-PFHxS	24019.78	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.20	9227.88	536.78	269.4	False	13C3-PFHxS	24019.78	236.50	ADONA	0.016	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.16	584635.59	472.99	764.7	False	d5-EtFOSAA	26736.81	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.16	5673.08	491.19	146.3	False	d5-EtFOSAA	26736.81	250.00	9Cl-PF3ONS	0.010	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	716789.95	462.43	1133.5	False	13C2-PFDoA	147402.60	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	3733.97	479.29	80.2	False	13C2-PFDoA	147402.60	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP84	**Injection Vial**	5
Sample ID	L4	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:47:34 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.46	386420.84	984.80	1568.1	False	13C3-PFBS	32128.80	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.46	117242.36	973.88	637.2	False	13C3-PFBS	32128.80	232.25	PFBS	0.303	0.314	✓
PFHxA_1	313.0 / 269.0	1.77	484642.64	1016.30	125.5	False	13C5-PFHxA	122711.34	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.77	38395.58	1098.11	129.7	False	13C5-PFHxA	122711.34	250.00	PFHxA	0.079	0.073	✓
PFHpA_1	363.0 / 319.0	2.17	517446.09	986.80	112.2	False	13C4-PFHpA	143188.33	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.17	13312.33	1096.30	116.6	False	13C4-PFHpA	143188.33	250.00	PFHpA	0.026	0.025	✓
PFHxS_1	399.0 / 80.0	2.19	450335.44	903.39	1229.2	False	13C3-PFHxS	28839.07	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.19	126150.55	906.58	1022.5	False	13C3-PFHxS	28839.07	236.50	PFHxS	0.280	0.285	✓
PFOA_1	413.0 / 369.0	2.58	599298.51	1014.89	330.5	False	13C8-PFOA	142213.31	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.58	42435.79	958.84	263.3	False	13C8-PFOA	142213.31	250.00	PFOA	0.071	0.074	✓
PFNA_1	463.0 / 419.0	2.96	595656.81	934.00	426.8	False	13C9-PFNA	155531.27	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.96	167342.24	954.16	280.6	False	13C9-PFNA	155531.27	250.00	PFNA	0.281	0.279	✓
PFOS_1	499.0 / 80.0	2.96	550156.86	1032.86	454.1	False	13C8-PFOS	26469.81	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.96	101041.14	1042.27	786.2	False	13C8-PFOS	26469.81	239.25	PFOS	0.184	0.187	✓
PFDA_1	513.0 / 469.0	3.32	685719.50	990.02	677.0	False	13C6-PFDA	160554.49	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.32	30791.17	966.31	645.0	False	13C6-PFDA	160554.49	250.00	PFDA	0.045	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	622216.80	1004.88	502.4	False	13C7-PFUnA	162338.67	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	31131.79	932.30	354.5	False	13C7-PFUnA	162338.67	250.00	PFUnA	0.050	0.050	✓
PFDoA_1	613.0 / 569.0	3.92	590788.53	1045.47	584.4	False	13C2-PFDoA	154625.46	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	92753.95	1024.61	593.3	False	13C2-PFDoA	154625.46	250.00	PFDoA	0.157	0.162	✓
PFTrDA_1	663.0 / 619.0	4.16	481059.59	1056.39	554.0	False	13C2-PFTeDA	136212.25	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.16	36508.74	1057.05	528.8	False	13C2-PFTeDA	136212.25	250.00	PFTrDA	0.076	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	536465.27	1048.09	1140.8	False	13C2-PFTeDA	136212.25	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	27539.02	1021.78	766.3	False	13C2-PFTeDA	136212.25	250.00	PFTeDA	0.051	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	91314.94	953.29	1550.2	False	d3-MeFOSAA	21942.28	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.47	54704.79	1003.63	18575.5	False	d3-MeFOSAA	21942.28	250.00	NMeFOSAA	0.599	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	101000.84	966.38	958.8	False	d5-EtFOSAA	26833.85	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.64	5650.04	995.85	1386.7	False	d5-EtFOSAA	26833.85	250.00	NEtFOSAA	0.056	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.88	474674.22	964.38	413.3	False	13C3-HFPO-DA	111695.55	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.88	13439.52	976.84	197.6	False	13C3-HFPO-DA	111695.55	250.00	HFPO-DA	0.028	0.029	✓
ADONA_1	377.0 / 251.0	2.21	1223431.58	983.26	671.5	False	13C3-PFHxS	28839.07	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.21	18123.05	946.95	272.7	False	13C3-PFHxS	28839.07	236.50	ADONA	0.015	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.16	1165901.44	961.14	1074.6	False	d5-EtFOSAA	26833.85	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.16	8530.70	748.30	177.0	False	d5-EtFOSAA	26833.85	250.00	9Cl-PF3ONS	0.007	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	1491355.73	1028.51	1388.7	False	13C2-PFDoA	154625.46	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	7316.00	987.92	114.6	False	13C2-PFDoA	154625.46	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP85	**Injection Vial**	6
Sample ID	L5	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 1:58:21 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.45	909071.96	2428.78	3017.1	False	13C3-PFBS	30718.40	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.45	275057.14	2420.15	964.3	False	13C3-PFBS	30718.40	232.25	PFBS	0.303	0.314	✓
PFHxA_1	313.0 / 269.0	1.76	1188865.07	2247.27	215.0	False	13C5-PFHxA	137468.31	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.76	84233.36	2164.43	195.8	False	13C5-PFHxA	137468.31	250.00	PFHxA	0.071	0.073	✓
PFHpA_1	363.0 / 319.0	2.17	1268872.96	2565.79	182.8	False	13C4-PFHpA	137055.77	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.16	28687.01	2586.22	191.0	False	13C4-PFHpA	137055.77	250.00	PFHpA	0.023	0.025	✓
PFHxS_1	399.0 / 80.0	2.19	1144605.34	2253.46	1158.4	False	13C3-PFHxS	29120.94	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.19	314070.94	2237.78	1009.1	False	13C3-PFHxS	29120.94	236.50	PFHxS	0.274	0.285	✓
PFOA_1	413.0 / 369.0	2.57	1438143.85	2460.41	467.6	False	13C8-PFOA	143112.35	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.57	106651.32	2432.72	369.5	False	13C8-PFOA	143112.35	250.00	PFOA	0.074	0.074	✓
PFNA_1	463.0 / 419.0	2.96	1443735.91	2233.58	662.1	False	13C9-PFNA	157960.49	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.96	406730.27	2301.49	384.5	False	13C9-PFNA	157960.49	250.00	PFNA	0.282	0.279	✓
PFOS_1	499.0 / 80.0	2.96	1307073.55	2274.79	488.3	False	13C8-PFOS	28578.51	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.96	243795.36	2357.31	782.9	False	13C8-PFOS	28578.51	239.25	PFOS	0.187	0.187	✓
PFDA_1	513.0 / 469.0	3.32	1648140.96	2389.54	762.2	False	13C6-PFDA	160687.18	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.32	74124.84	2324.84	887.6	False	13C6-PFDA	160687.18	250.00	PFDA	0.045	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	1497697.84	2362.57	581.8	False	13C7-PFUnA	168173.70	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	81585.49	2314.14	612.3	False	13C7-PFUnA	168173.70	250.00	PFUnA	0.054	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	1452269.34	2556.22	628.1	False	13C2-PFDoA	157571.90	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	230569.82	2549.96	739.8	False	13C2-PFDoA	157571.90	250.00	PFDoA	0.159	0.162	✓
PFTrDA_1	663.0 / 619.0	4.16	1170821.89	2539.58	792.3	False	13C2-PFTeDA	140882.36	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.16	87567.91	2589.37	683.0	False	13C2-PFTeDA	140882.36	250.00	PFTrDA	0.075	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	1333139.90	2578.11	1260.6	False	13C2-PFTeDA	140882.36	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	72573.28	2664.13	1314.0	False	13C2-PFTeDA	140882.36	250.00	PFTeDA	0.054	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	244233.00	2600.32	3513.5	False	d3-MeFOSAA	22147.53	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.47	142665.99	2626.90	7587.1	False	d3-MeFOSAA	22147.53	250.00	NMeFOSAA	0.584	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	246021.03	2632.24	1142.2	False	d5-EtFOSAA	24164.98	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.63	12220.84	2386.07	16002.9	False	d5-EtFOSAA	24164.98	250.00	NEtFOSAA	0.050	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.88	1090124.87	2384.40	533.5	False	13C3-HFPO-DA	106241.74	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.88	32208.42	2578.34	275.8	False	13C3-HFPO-DA	106241.74	250.00	HFPO-DA	0.030	0.029	✓
ADONA_1	377.0 / 251.0	2.20	2851754.86	2288.17	840.4	False	13C3-PFHxS	29120.94	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.20	41469.70	2283.11	398.3	False	13C3-PFHxS	29120.94	236.50	ADONA	0.015	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.16	2686309.04	2492.75	1051.6	False	d5-EtFOSAA	24164.98	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.16	23957.40	2386.15	250.6	False	d5-EtFOSAA	24164.98	250.00	9Cl-PF3ONS	0.009	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.77	3368018.90	2416.99	1451.6	False	13C2-PFDoA	157571.90	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.77	16675.59	2341.80	196.6	False	13C2-PFDoA	157571.90	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP86	**Injection Vial**	7
Sample ID	L6	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:09:07 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.44	3509836.31	9022.41	3005.7	False	13C3-PFBS	31963.53	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.44	1091935.25	9292.36	1900.6	False	13C3-PFBS	31963.53	232.25	PFBS	0.311	0.314	✓
PFHxA_1	313.0 / 269.0	1.75	4620859.91	10543.35	398.5	False	13C5-PFHxA	114615.79	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.75	334049.56	10349.77	301.3	False	13C5-PFHxA	114615.79	250.00	PFHxA	0.072	0.073	✓
PFHpA_1	363.0 / 319.0	2.15	4758602.70	10521.89	362.9	False	13C4-PFHpA	126228.95	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.15	105288.31	10587.85	362.2	False	13C4-PFHpA	126228.95	250.00	PFHpA	0.022	0.025	✓
PFHxS_1	399.0 / 80.0	2.18	4243040.38	9325.60	1197.5	False	13C3-PFHxS	25967.10	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.18	1174382.97	9389.42	922.8	False	13C3-PFHxS	25967.10	236.50	PFHxS	0.277	0.285	✓
PFOA_1	413.0 / 369.0	2.56	5384321.00	9793.68	670.5	False	13C8-PFOA	135794.76	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.56	404844.48	9808.36	646.8	False	13C8-PFOA	135794.76	250.00	PFOA	0.075	0.074	✓
PFNA_1	463.0 / 419.0	2.95	5451995.40	9927.33	700.2	False	13C9-PFNA	134364.06	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.95	1486315.75	9929.97	608.1	False	13C9-PFNA	134364.06	250.00	PFNA	0.273	0.279	✓
PFOS_1	499.0 / 80.0	2.95	4847409.05	9527.49	724.4	False	13C8-PFOS	25319.25	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.95	902193.95	9918.61	1071.5	False	13C8-PFOS	25319.25	239.25	PFOS	0.186	0.187	✓
PFDA_1	513.0 / 469.0	3.31	5949444.11	10110.80	991.1	False	13C6-PFDA	137459.88	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.31	270488.89	9918.28	749.7	False	13C6-PFDA	137459.88	250.00	PFDA	0.045	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	5329646.27	9701.54	841.1	False	13C7-PFUnA	146714.28	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	295658.36	9521.50	787.6	False	13C7-PFUnA	146714.28	250.00	PFUnA	0.055	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	5337499.30	10271.10	1167.0	False	13C2-PFDoA	145155.89	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	850907.48	10321.13	963.3	False	13C2-PFDoA	145155.89	250.00	PFDoA	0.159	0.162	✓
PFTrDA_1	663.0 / 619.0	4.15	4534951.98	10418.35	1220.9	False	13C2-PFTeDA	134581.82	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.15	317834.95	10131.27	1033.3	False	13C2-PFTeDA	134581.82	250.00	PFTrDA	0.070	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	5089298.48	10430.69	2616.3	False	13C2-PFTeDA	134581.82	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	267185.11	10379.35	1854.9	False	13C2-PFTeDA	134581.82	250.00	PFTeDA	0.052	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	885018.98	9882.13	1102.5	False	d3-MeFOSAA	21915.60	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.47	516467.16	9735.67	1551.8	False	d3-MeFOSAA	21915.60	250.00	NMeFOSAA	0.584	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	889736.27	9801.97	1282.4	False	d5-EtFOSAA	23868.32	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.63	50570.62	10453.35	1172.2	False	d5-EtFOSAA	23868.32	250.00	NEtFOSAA	0.057	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.86	4283008.99	10249.45	852.4	False	13C3-HFPO-DA	109352.39	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.87	114111.34	9952.18	400.1	False	13C3-HFPO-DA	109352.39	250.00	HFPO-DA	0.027	0.029	✓
ADONA_1	377.0 / 251.0	2.19	11240032.88	10162.23	1011.6	False	13C3-PFHxS	25967.10	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.19	163556.08	10469.23	888.4	False	13C3-PFHxS	25967.10	236.50	ADONA	0.015	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.15	10282596.78	9722.35	1183.7	False	d5-EtFOSAA	23868.32	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.15	89163.10	9059.66	498.4	False	d5-EtFOSAA	23868.32	250.00	9Cl-PF3ONS	0.009	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	13349163.46	10773.03	1308.4	False	13C2-PFDoA	145155.89	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	65600.53	10349.81	320.2	False	13C2-PFDoA	145155.89	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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PFAS Calibration Quant Report

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Sample Name	KP87	**Injection Vial**	8
Sample ID	L7	**Injection Volume**	10.00
Sample Type	Standard	**Instrument Name**	QTRAP 5500
Acquisition Date	9/1/2019 2:19:54 AM	**Data File**	AC_09012019_5-369.wiff
Acquisition Method	5-0369.dam	**Result Table**	19-0746
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Area	Conc. (ng/L)	S/N Ratio	Modified	IS	IS Area	IS Conc. (ng/L)	Ratio Group	Ion Ratio	Expected Ion Ratio	Ratio OK
PFBS_1	298.9 / 80.0	1.43	7533671.07	21371.85	1623.6	False	13C3-PFBS	28970.90	232.25	PFBS			
PFBS_2	298.9 / 99.0	1.43	2246698.40	21121.00	1879.9	False	13C3-PFBS	28970.90	232.25	PFBS	0.298	0.314	✓
PFHxA_1	313.0 / 269.0	1.74	9737586.95	19989.17	511.5	False	13C5-PFHxA	127501.03	250.00	PFHxA			
PFHxA_2	313.0 / 119.0	1.74	724292.82	20186.56	435.4	False	13C5-PFHxA	127501.03	250.00	PFHxA	0.074	0.073	✓
PFHpA_1	363.0 / 319.0	2.15	9856683.19	19417.65	426.1	False	13C4-PFHpA	141828.35	250.00	PFHpA			
PFHpA_2	363.0 / 169.0	2.15	213941.09	19224.03	410.1	False	13C4-PFHpA	141828.35	250.00	PFHpA	0.022	0.025	✓
PFHxS_1	399.0 / 80.0	2.17	9339529.92	21284.02	796.1	False	13C3-PFHxS	25023.12	236.50	PFHxS			
PFHxS_2	399.0 / 99.0	2.17	2558912.28	21233.01	891.2	False	13C3-PFHxS	25023.12	236.50	PFHxS	0.274	0.285	✓
PFOA_1	413.0 / 369.0	2.56	11190789.46	20194.94	822.9	False	13C8-PFOA	137081.45	250.00	PFOA			
PFOA_2	413.0 / 169.0	2.56	841562.73	20224.48	796.2	False	13C8-PFOA	137081.45	250.00	PFOA	0.075	0.074	✓
PFNA_1	463.0 / 419.0	2.95	11365219.78	20364.89	993.4	False	13C9-PFNA	136562.08	250.00	PFNA			
PFNA_2	463.0 / 219.0	2.95	3084333.97	20288.03	806.0	False	13C9-PFNA	136562.08	250.00	PFNA	0.271	0.279	✓
PFOS_1	499.0 / 80.0	2.95	10669768.09	21004.25	528.1	False	13C8-PFOS	25281.81	239.25	PFOS			
PFOS_2	499.0 / 99.0	2.95	1861358.64	20518.07	743.3	False	13C8-PFOS	25281.81	239.25	PFOS	0.174	0.187	✓
PFDA_1	513.0 / 469.0	3.31	11473745.19	20006.41	837.6	False	13C6-PFDA	134030.10	250.00	PFDA			
PFDA_2	513.0 / 219.0	3.31	541108.04	20349.45	729.5	False	13C6-PFDA	134030.10	250.00	PFDA	0.047	0.045	✓
PFUnA_1	563.0 / 519.0	3.63	10725772.00	20382.65	910.5	False	13C7-PFUnA	140693.12	250.00	PFUnA			
PFUnA_2	563.0 / 269.0	3.63	616998.15	20686.35	777.4	False	13C7-PFUnA	140693.12	250.00	PFUnA	0.058	0.050	✓
PFDoA_1	613.0 / 569.0	3.91	11070132.89	19616.03	1231.3	False	13C2-PFDoA	157813.65	250.00	PFDoA			
PFDoA_2	613.0 / 319.0	3.91	1752726.58	19586.07	991.1	False	13C2-PFDoA	157813.65	250.00	PFDoA	0.158	0.162	✓
PFTrDA_1	663.0 / 619.0	4.16	9508214.78	19456.66	1508.8	False	13C2-PFTeDA	151359.58	250.00	PFTrDA			
PFTrDA_2	663.0 / 169.0	4.15	692076.44	19713.17	1407.4	False	13C2-PFTeDA	151359.58	250.00	PFTrDA	0.073	0.075	✓
PFTeDA_1	713.0 / 669.0	4.37	10628668.24	19405.74	2563.9	False	13C2-PFTeDA	151359.58	250.00	PFTeDA			
PFTeDA_2	713.0 / 169.0	4.37	560449.00	19392.37	2630.0	False	13C2-PFTeDA	151359.58	250.00	PFTeDA	0.053	0.052	✓
NMeFOSAA_1	570.0 / 419.0	3.47	1900403.19	20052.14	856.3	False	d3-MeFOSAA	24162.21	250.00	NMeFOSAA			
NMeFOSAA_2	570.0 / 512.0	3.47	1161929.64	20118.47	1352.5	False	d3-MeFOSAA	24162.21	250.00	NMeFOSAA	0.611	0.566	✓
NEtFOSAA_1	584.0 / 419.0	3.63	1797696.87	20087.12	1442.9	False	d5-EtFOSAA	24076.16	250.00	NEtFOSAA			
NEtFOSAA_2	584.0 / 483.0	3.63	90723.30	19761.05	968.1	False	d5-EtFOSAA	24076.16	250.00	NEtFOSAA	0.050	0.052	✓
HFPO-DA_1	285.0 / 169.0	1.86	8315048.84	19834.77	993.0	False	13C3-HFPO-DA	129222.78	250.00	HFPO-DA			
HFPO-DA_2	285.0 / 118.8	1.86	230687.82	20022.07	614.5	False	13C3-HFPO-DA	129222.78	250.00	HFPO-DA	0.028	0.029	✓
ADONA_1	377.0 / 251.0	2.19	21302291.77	19999.78	873.0	False	13C3-PFHxS	25023.12	236.50	ADONA			
ADONA_2	377.0 / 85.0	2.19	295987.15	19756.05	948.9	False	13C3-PFHxS	25023.12	236.50	ADONA	0.014	0.015	✓
9Cl-PF3ONS_1	531.0 / 351.0	3.15	19240174.45	18053.28	1008.9	False	d5-EtFOSAA	24076.16	250.00	9Cl-PF3ONS			
9Cl-PF3ONS_2	531.0 / 83.0	3.15	188081.48	18972.63	676.4	False	d5-EtFOSAA	24076.16	250.00	9Cl-PF3ONS	0.010	0.009	✓
11Cl-pf3OUdS_1	631.0 / 451.0	3.76	23329783.93	17386.24	1321.0	False	13C2-PFDoA	157813.65	250.00	11Cl-PF3OUdS			
11Cl-pf3OUdS_2	631.0 / 83.0	3.76	122783.50	17894.92	323.3	False	13C2-PFDoA	157813.65	250.00	11Cl-PF3OUdS	0.005	0.005	✓

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APPENDIX E
ANALYTICAL DATA SUMMARY

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APPENDIX E
DATA SUMMARY OF PFAS RESULTS
GROUNDWATER SAMPLING - AUGUST 2019
CTO WE14 NAVAL STATION PHILADELPHIA, PENNSYLVANIA

Location:	**Project**	**NSP-MW-02**		**NSP-MW-03**		**NSP-MW-03**		**NSP-MW-04**		**NSP-MW-07**	
Sample Name:	**Screening**	**NSP-MW-02-20190812**		**NSP-MW-03-20190812**		**NSP-DUP-01-20190812**		**NSP-MW-04-20190812**		**NSP-MW-07-20190812**	
Sample Date:	**Levels**	**08/12/2019**		**08/12/2019**		**08/12/2019**		**08/12/2019**		**08/12/2019**	
Duplicate of:						**NSP-MW-03-20190812**					
PFAS		**ng/L**		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	400	271.08		282.81		293.17		285.08		26922.24	
PERFLUOROOCTANESULFONIC ACID (PFOS)	400	833.54		1513.80		1252.90		118.31	J	910.79	
PERFLUOROBUTANESULFONIC ACID (PFBS)	400,000	126.83		140.75		105.77		68.30	J	15784.56	
PERFLUOROHEXANOIC ACID (PFHXA)		272.64		267.51		278.06		263.28	J	72221.27	
PERFLUOROHEPTANOIC ACID (PFHPA)		108.11		144.16		146.13		211.01	J	6952.67	
PERFLUORONONANOIC ACID (PFNA)		82.31		99.03		96.79		142.34		25.85	
PERFLUORODECANOIC ACID (PFDA)		9.93		9.00		7.24		1.07	J	0.44	J
PERFLUOROUNDECANOIC ACID (PFUNA)		2.80	J	1.06	J	0.72	J	0.93	U	0.96	U
PERFLUORODODECANOIC ACID (PFDOA)		0.48	U	0.49	U	0.47	U	0.46	U	0.48	U
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.48	U	0.49	U	0.47	U	0.46	U	0.48	U
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.96	U	0.98	U	0.94	U	0.93	U	0.96	U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE (NMFOSA)		1.92	U	1.96	U	1.89	U	1.85	U	1.92	U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE (NEFOSA)		0.96	U	0.98	U	0.94	U	0.93	U	0.96	U
PERFLUOROHEXANESULFONIC ACID (PFHXS)		423.36		609.40		547.78		336.54		48171.51	
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		1.90	J	2.70	J	2.51	J	3.35	J	2.06	J
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11CL-PF3OUDS)		0.38	U	0.39	U	0.38	U	0.37	U	0.38	U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9CL-PF3ONS)		0.38	U	0.39	U	0.38	U	0.37	U	0.38	U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.38	U	0.39	U	0.38	U	0.37	U	0.38	U

APPENDIX E
DATA SUMMARY OF PFAS RESULTS
GROUNDWATER SAMPLING - AUGUST 2019
CTO WE14 NAVAL STATION PHILADELPHIA, PENNSYLVANIA

Location:	**Project**	**NSP-MW-08**		**QC**		**QC**		**QC**	
Sample Name:	**Screening**	**NSP-MW-08-20190812**		**NSP-Driller Water-20190810**		**NSP-FB-03-20190812**		**NSP-EB-01-20190812**	
Sample Date:	**Levels**	**08/12/2019**		**08/10/2019**		**08/12/2019**		**08/12/2019**	
Duplicate of:									
PFAS		**ng/L**		**ng/L**		**ng/L**		**ng/L**	
PENTADECAFLUOROOCTANOIC ACID (PFOA)	400	90.40		0.92	U	0.19	J	0.48	J
PERFLUOROOCTANESULFONIC ACID (PFOS)	400	285.24		0.34	U	0.44	U	0.30	J
PERFLUOROBUTANESULFONIC ACID (PFBS)	400,000	71.78		0.42	U	0.44	U	0.19	J
PERFLUOROHEXANOIC ACID (PFHXA)		182.32		1.80	U	0.44	U	0.78	J
PERFLUOROHEPTANOIC ACID (PFHPA)		106.36		0.49	U	0.44	U	0.44	U
PERFLUORONONANOIC ACID (PFNA)		48.42		0.98	U	0.88	U	0.88	U
PERFLUORODECANOIC ACID (PFDA)		1.27	J	0.49	U	0.44	U	0.44	U
PERFLUOROUNDECANOIC ACID (PFUNA)		0.89	U	0.98	U	0.88	U	0.88	U
PERFLUORODODECANOIC ACID (PFDOA)		0.45	U	0.49	U	0.44	U	0.44	U
PERFLUOROTRIDECANOIC ACID (PFTRIA)		0.45	U	0.49	U	0.44	U	0.44	U
PERFLUOROTETRADECANOIC ACID (PFTEA)		0.89	U	0.98	U	0.88	U	0.88	U
N-METHYLPERFLUOROOCTANE SULFONAMIDOACETATE (NMFOSA)		1.79	U	1.96	U	1.75	U	1.75	U
N-ETHYLPERFLUOROOCTANE SULFONAMIDOACETATE (NEFOSA)		0.89	U	0.98	U	0.88	U	0.88	U
PERFLUOROHEXANESULFONIC ACID (PFHXS)		188.46		1.18	U	0.35	U	0.57	J
HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)		1.69	J	0.37	J	0.35	U	0.35	U
11-CHLOROEICOSAFLUORO-3-OXAUNDECANE-1-SULFONIC ACID (11CL-PF3OUDS)		0.36	U	0.39	U	0.35	U	0.35	U
9-CHLOROHEXADECAFLUORO-3-OXANONE-1-SULFONIC ACID (9CL-PF3ONS)		0.36	U	0.39	U	0.35	U	0.35	U
4,8-DIOXA-3H-PERFLUORONONANOIC ACID (ADONA)		0.36	U	0.39	U	0.35	U	0.35	U

APPENDIX E
DATA SUMMARY OF PFAS RESULTS
GROUNDWATER SAMPLING - AUGUST 2019
CTO WE14 NAVAL STATION PHILADELPHIA, PENNSYLVANIA

Data Qualifiers:
J -- 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).
U -- The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted detection limit.

Screening Levels:
PFBS -- Regional Screening Level (RSL) for Residential Tapwater
at THQ=1.0 (May 2019).
PFOA - Calculated RSL for Residential Tapwater using the EPA Online Calculator with Default Input Parameters at THQ=1.0.
PFOS - Calculated RSL for Residential Tapwater using the EPA Online Calculator with Default Input Parameters at THQ=1.0.

Highlighted values exceed the associated screening level.